Clarkson University is a nationally-ranked research university and the institution of choice for more than 3,800 enterprising, high-ability scholars from diverse backgrounds who embrace challenge and thrive in a rigorous, highly collaborative learning environment. We add value to our students’ education by partnering with leading businesses, industries and thought leaders to bring relevance to the challenges and needs of a modern world in which the boundaries of knowledge, discipline, nations, and cultures blur. We encourage students to question the status quo, push the limits of what is known, and to apply their ingenuity to develop fresh solutions to real-world challenges. For more than 100 years, our graduates have achieved extraordinary professional success, risen to societal challenges, and advanced the global economy ethically and responsibly. Among our 38,000 alumni, one in five is a CEO, senior executive or owner of a company.

Founded in 1896 to honor Thomas S. Clarkson, the University’s main campus is located in the “college town” of Potsdam, NY on a historic 640-acre wooded homestead in the foothills of the Adirondack Park. With three other universities nearby, Clarkson community members enjoy a constantly changing social and intellectual quality of life largely influenced by our proximity to the north slope of the Adirondacks; easy drives to Lake Placid as well as Ottawa and Montreal, Canada; and a high level of regional camaraderie to encourage innovative partnerships in small business development, arts, tourism, recreation, agriculture and green energy.

Clarkson’s educational strengths include:
- rigorous professional preparation
- dynamic, real-world learning
- highly collaborative community
- teamwork that spans disciplines

QUESTIONS regarding undergraduate admission and requests for information about Clarkson may be directed to the Office of Undergraduate Admissions.
Changes in Curricula
Information contained in this catalog is current at the time the catalog is posted on our Web site, but as courses and curricula undergo changes by official action of the University, occasionally such changes may supersede information found herein. The accuracy of any particular information can be checked through the Office of Undergraduate Admission, Student Administrative Services, the Dean of the appropriate School, or academic departments.

Please be aware that the information concerning academic requirements, courses, and programs of study in the catalog does not establish an irrevocable contract between the student and the University. The University can change, discontinue, or add academic requirements, courses, and programs of study at any time, without notice. Although every effort is made to provide timely notice to students in order to help in the planning process, it is the responsibility of the student to confirm that all appropriate degree requirements are met.

All students are encouraged to read the catalog thoroughly. Failure to be familiar with the contents does not excuse a student from the requirements and regulations described herein.

Courses
Typical courses for each department are listed in this catalog, but not all courses are offered each year. Descriptions of courses and terms in which specific course are offered are accessible in PeopleSoft. Viewing Clarkson’s searchable course catalog will give up-to-date course descriptions, pre- or co-requisites, course attributes, and other information pertaining to all courses offered. Clarkson’s browse course catalog can be viewed at www.clarkson.edu/sas/classes_schedules/index.html. There is no log-in required - just select the term and year that you are interested in viewing.

Course credit is also available for Independent Study and Special Projects.
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First Year (Domestic & International)
Clarkson University
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Potsdam, NY 13699
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Fax 315-268-7647
E-mail admission@clarkson.edu

CLARKSON SCHOOL ADMISSIONS
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Clarkson University
Box 5650
Potsdam, NY 13699
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Email tcs@clarkson.edu

TRANSFER ADMISSIONS (Domestic & International)
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Box 5610, 8 Clarkson Avenue
Potsdam, NY 13699
800-527-6577
315-268-2125
Fax 315-268-7647
E-mail tradmission@clarkson.edu
THE CLARKSON EDUCATION

Clarkson academic programs span boundaries and vary widely in content. However, at the heart of the institution’s educational process are fundamental goals and values that define a common learning experience and shape the growth of every Clarkson student. The University has articulated its mission, vision, and values as follows:

Mission of Clarkson University

Clarkson University is an independent, nationally recognized technological university whose faculty of teacher/scholars aspires to offer superior instruction and engage in high-quality research and scholarship in engineering, business, science, health, and liberal arts. Our primary mission is to educate talented and motivated men and women to become successful professionals through quality pre-collegiate, undergraduate, graduate, and professional continuing education programs, with particular emphasis on the undergraduate experience. Our community and campus settings enhance the quality of student life and afford students access to and interaction with their faculty. We value the diversity of our University community, and we strive to attune ourselves and our programs to our global, pluralistic society. We share the belief that humane and environmentally sound economic and social development derive from the expansion, diffusion, and application of knowledge.

Vision of a Clarkson Education

The Clarkson University educational experience is designed to provide talented and ambitious students with the knowledge and skills necessary to achieve positions of leadership within their chosen profession. The combination of Clarkson’s strong technologically rich curricula and state-of-the-art teaching and research facilities, coupled with an unparalleled commitment to a friendly learning environment and to students’ personal development, uniquely prepares Clarkson graduates to excel in their chosen professions and to lead rewarding and creative lives.

In addition to attaining mastery of the core knowledge within his or her field, a Clarkson education is designed to enable students to:

- solve real-world, open-ended problems with creativity and risk taking to obtain solutions that are practical and sustainable, including those they encounter in state-of-the-art research under the direction of distinguished faculty;
- develop and refine exceptional communication skills with an awareness of potential cultural differences;
- lead effectively and work productively within and disciplinary and multidisciplinary teams composed of members with diverse interests and backgrounds;
- excel in using computing and information technologies;
- learn through instruction and guidance by nationally recognized faculty whose commitment to both teaching and research has made Clarkson a nationally ranked university.
A Clarkson student’s education is greatly enhanced by a personal and friendly learning environment, within a small, residential, nationally recognized University, which:

- places students at the center of the educational process and where all employees have a commitment to creating an environment that contributes positively to students’ overall educational experience;
- draws undergraduates, graduate students, faculty and staff together into a cohesive and stimulating learning community, wherein an atmosphere of scholarship and spirit of research is cultivated;
- uses our campus as a living laboratory to improve learning, and uses the wider region to broaden and extend Clarkson's outreach and service;
- provides personal advising and interaction with faculty and staff as well as supportive relationships among students;
- offers many leadership opportunities through co-curricular groups and activities;
- respects and learns from its community of diverse people, backgrounds, and cultures.

Together, these provide a unique educational experience that is directed toward developing the whole person.

**Major Values of the Clarkson Community**

"Lead By Example and Others Will Follow"

**Caring:** A positive and friendly atmosphere is created when we care about each other, when we are open to constructive criticism, and when we show appreciation for a job well done.

**Diligence:** "A workman that needeth not to be ashamed." Initiative and hard work are key ingredients in getting the task done.

**Diversity:** The mutual appreciation of differences and a plurality of opinions, beliefs, and cultural traditions inform and enrich our lives.

**Integrity:** Honesty and accountability in one’s actions and words form the foundation of our relationships with others.

**Growth:** Educational experiences in and out of the classroom enliven our minds, broaden our horizons, and facilitate dialogue and consensus. Learning is a lifelong activity.

**Service:** Offering our time and skills for the good of our fellow citizens leads to the prosperity and environmental health of the community and to the well-being and character development of the individual.

**Teamwork:** Effective teamwork encourages creativity and self-initiative in our respective roles and partnerships. It is essential in getting the task done and in developing the skills needed to meet the challenges of ensuring sustainability of local and global economic, environmental and social systems.

**Vision:** Having a vision of a sustainable future helps us prepare for it. Embracing the inevitable changes in our world as opportunities allow us to anticipate, promote, and facilitate change.
ABOUT CLARKSON UNIVERSITY

Clarkson is recognized among the finest universities in the nation, according to such diverse measures as U.S. News & World Report, the Association for Independent Technological Universities, and corporate recruiters. Clarkson focuses on providing a rigorous professional experience, connecting discovery and engineering innovation with enterprise, and developing a collaborative community for students, faculty and staff.

Graduates are known for their innovative thinking and problem-solving skills as well as their ability to create, adapt and manage technology for the benefit of society. One Clarkson graduate in five is a president, CEO, vice president or senior executive of a company.

The University was founded in 1896 as a memorial to Thomas S. Clarkson, a northern New York businessman with a deep concern for humanity. Today, the University continues to reflect his fundamental values: a commitment to professional skill and competence coupled with personal integrity and human understanding. The University is known as a friendly school where students benefit from personal attention and close interaction with our distinguished faculty of teacher/scholars.

Clarkson is located on a 640-acre wooded campus in the historic village of Potsdam (pop. 9,500), where the rolling foothills of the Adirondack Mountains meet the St. Lawrence River Valley. The school attracts high-ability students who seek a rigorous comprehensive education in a scenic, friendly environment. Outdoor enthusiasts enjoy recreational opportunities in the nearby Adirondack Park (six million acres) and Thousand Islands region. Lake Placid and international attractions in Ottawa and Montreal are a short drive away.

Clarkson is recognized for both teaching and research. Undergraduate programs provide excellent preparation for advanced degrees and for immediate career opportunities. Placement rates are consistently high and an active alumni network fosters success.

Admission is highly selective and most entering first-year students have graduated in the top 20 percent of their high school classes. The Honors Program annually accepts approximately 65 or so exceptionally talented students who enrich their degree programs through a sequence of seminars focused on technological issues and challenges confronting contemporary society.

Students develop skills in teamwork, communication, leadership and creative problem solving, in addition to mastery of fundamentals and evolving technologies. Open-ended, hands-on projects connect business, engineering, and arts and sciences through an emphasis on boundary-spanning solutions and practical applications.

The University offers degrees in traditional academic fields, along with majors that cut across and combine disciplines such as biomolecular science, environmental science and policy, information technology, software engineering, and digital arts and sciences.

National recognition of educational quality at Clarkson includes:
Clarkson is in the top 3% of Best Value Colleges in the nation, 2016 PayScale College ROI Report.

Clarkson is one of the Top-25 Colleges with Highest Salaries After Graduation, Forbes 2016.

Clarkson is the #9 Best Value Online MBA & Health Management Program, Value Colleges 2016.

Clarkson is one of the Top-21 STEM (Science, Technology, Engineering, Math) Colleges, Forbes 2016

One of the Top-100 Values in Private Universities, Kiplinger’s Best College Values 2016.

Clarkson graduates have some of the highest salaries in the nation, 2016 College Salary Report, PayScale Inc.


#5 Best Value College in New York State, SmartAsset 2016.

Top-10 Colleges with Most Impressive Job Rates and Career Services, Online Schools Center 2016.


Best Values (Great Schools, Great Prices), U.S. News & World Report, America’s Best Colleges 2016.


Top-50 Best Bachelor's in Engineering Degree Programs, College Choice 2016


Online MBA Program ranked as one of the top 40 in the nation, U.S. News & World Report, Best Online MBA Programs 2016.
Clarkson selected as a "Top School," *2016 Military Advanced Education & Transition (MAE&T) Guide to Colleges & Universities.*

Among the nation’s "Best 380 Colleges," *The Princeton Review 2016.*

One of the "50 Colleges Where Students Earn the Highest Salaries," *Business Insider 2015.*

One of "10 Great Colleges for Business Majors," *TIME* magazine 2015

Top 25 Private Online MBA Programs, *Online MBA Report 2015*

One of the "Top 10 Engineering Colleges in the U.S.," *USA Today 2015.*

Among the top 20 entrepreneurship undergraduate programs in the nation, *Entrepreneur* magazine and *The Princeton Review 2016.*

Top 10: Universities that increase salaries the most, A Clarkson degree will increase your earnings by 42 percent, on average, *Brookings Institution 2015.*

#4 of The 50 Most Technologically Advanced Small Colleges, *The Best Colleges 2015.*

One of the most affordable colleges whose undergraduate alumni report earning more than $100,000 a year, *MONEY Magazine 2015.*


#12 Best Master’s Degree Programs by Salary Potential, *2015 College Salary Report, PayScale Inc.*

One of the Most Selective Online Business Degrees, *SR Education Group 2015.*

"Top 50 Best Value Online MBA Programs" list, *Value Colleges 2015.*

One of the Top-100 Values in Private Universities, *Kiplinger’s Best College Values 2015.*


Ranked as a Top 15% College in the outcome-based *2015 Educate to Career (ETC) College Rankings Index.*
Sierra Club & Princeton Review Honor Clarkson University for Commitment to Sustainability. The Sierra Club has named Clarkson University one of the Cool Schools for 2016.


Ranked one of the 10 Most Underrated Colleges in America, Business Insider 2015.

Ranked #69 college in America by alumni earnings above expectation, The Economist 2015.

One of America’s Best Small Town Colleges. BestColleges.com 2015.


ROTC service ranked #3 in the nation, Washington Monthly 2015.

Top 50 America’s Most Entrepreneurial Universities, Forbes 2014.

Top 100 Graduate Business Schools in the Nation, U.S. News & World Report, Best Graduate Schools 2014.

Ranks #37 for faculty receiving significant research awards in the national universities category, Washington Monthly 2014.

Clarkson ranks #7 in New York state for colleges and universities that provide the highest return on investment (ROI), Affordable Colleges Online 2013.

#1 in the nation for grads with most internship experience, U.S. News & World Report 2013.

Top 30 Private Colleges with Million-Dollar Returns on Investment, Affordable Colleges Online 2013.

Clarkson is one of 12 schools whose new graduates earn more than Harvard’s, ABC News & PayScale 2012.

Engineering & Management program is only the second program in the world to be accredited by both AACSB International and the Engineering Accreditation Commission of ABET.

Collaborative projects to solve real-world problems prepare students in all majors for the team-oriented global workplace. Some 400 undergraduates a year perform faculty-mentored research or participate in national academic team competitions through Clarkson’s award-winning program called SPEED (Student Projects for Engineering Experience and Design). Competition projects range from environmental problem solving to Mini-Baja vehicle racing to FIRST Robotics. All business students work on entrepreneurial teams that create and run actual companies. More than 40 study abroad programs in 21 countries, as well as internships,
workplace co-ops, and research fellowships, broaden the undergraduate educational experience.

Clarkson’s major organizational units are the School of Arts & Sciences, the School of Business, the Wallace H. Coulter School of Engineering, the Institute for a Sustainable Environment, the Graduate School, the Division of Research, and The Clarkson School, a unique program in which talented high school age students can begin college early.

Clarkson’s campus includes several academic research centers that leverage the University's scholarly strengths. The Center for Advanced Materials Processing (CAMP), which is also a New York State Center for Advanced Technology, contains state-of-the-art research laboratories that enable faculty to pursue cutting-edge research and are accessible to undergraduates and graduate students for collaborative projects.

The Clarkson Institute for a Sustainable Environment (ISE) facilitates boundary-spanning environmental research and educational activities within the University and through external partnerships. Students from across campus can integrate sustainability into their curricular or co-curricular education by adding one of ISE’s minor programs in Environmental Science, Environmental Policy, Environmental Health Sciences, or Sustainable Solutions for the Developing World; writing a proposal to implement a sustainability project on campus; participate in research or spend a semester immersed in the social, environmental and economic issues of the Adirondack Park as a part of the ISE Adirondack Semester. In addition to the Institute’s core faculty, Institute affiliated faculty come from all schools on campus and also receive millions of dollars in research and educational grants that translates into opportunities for students to get involved in funded research projects. ISE also houses the Center for Sustainable Energy Systems (CSES) and the Center for Air Resources Engineering and Science (CARES).

The Center for Rehabilitation Engineering, Science and Technology (CREST) serves to integrate biomedical engineering and science with assistive and adaptive technologies and physical therapy to improve lives affected by disease or injury.

The Cora and Bayard Clarkson Science Center is home to mathematics, computer science, biology, biomolecular science, chemistry, physics, psychology and statistics. It also houses the President’s Office.

Bertrand H. Snell Hall houses the School of Business, the administrative offices of the School of Arts & Sciences, Department of Humanities and Social Sciences, Department of Communication & Media and the Digital Arts & Sciences program. Fully networked classrooms and study spaces, collaborative centers for team projects, and videoconferencing capabilities are among state-of-the-art features that enhance student learning. The building includes three academic centers available to students in all majors: the Shipley Center for Innovation, the Center for Innovation and Entrepreneurship, and the Eastman Kodak Center for Excellence in Communication. Bertrand H. Snell Hall is connected to the Cora and Bayard Clarkson Science
Center by the third story Petersen Passageway.

Clarkson’s physical facilities are valued at $269.4 million. They comprise approximately 1,324,053 square feet of assignable space, of which almost 90 percent has been built since 1970. More than 339,410 sq. ft. are dedicated exclusively to academic programs, including 51,559 sq. ft. in traditional classrooms and 162,941 sq. ft. assigned in laboratory areas.

**Retention studies** of independent institutions in New York State show on average that 68.9 percent of students who enter as freshmen complete their degrees within six years, and 56.1 percent in four years. At these same schools, the sampling of transfer students shows 63.5 percent completing their degrees in four years and 67.6 percent in six years.

At Clarkson the retention rate is well above the norm: averaged among those completing degrees over the past three years, 73.2 percent of freshmen completed their studies for a bachelor’s degree within six years; 72.1 percent in five years; and 55.8 percent in four years or less. *Among transfer students, 45.7 percent complete their bachelor’s degrees in two years and 83.5 percent in four years.*

*Under the Student Right to Know Act, the federal government requires the University to publish the six-year graduation rate for students who have enrolled as first-time freshmen. Clarkson operates a unique program known as The Clarkson School, which allows students to begin their college career one year early (see Undergraduate Admission). This program attracts some students who may not intend to remain at Clarkson for four years and inclusion of these students in the total has the effect of making that published rate misleading. The inclusion of Clarkson School students makes the University’s six-year graduation rate 71.1 percent.*
A BRIEF HISTORY OF CLARKSON
(The following summary has been excerpted largely from A Clarkson Mosaic, a history written by Professor Emeritus Bradford B. Broughton in conjunction with the institution’s 1996 Centennial.)

Two months after a highly successful Potsdam businessman, Thomas Streatfeild Clarkson, was crushed to death while trying to save one of his workers in his sandstone quarry on August 17, 1894, his family began planning a memorial to him: a school.

Choosing as their rationale a phrase which his sisters and nieces felt aptly described their brother — Thomas’ favorite Biblical quotation, A workman that needeth not to be ashamed — the family opened the Thomas S. Clarkson Memorial School of Technology in September 1896, in The Main Building (“Old Main”) which they commissioned to be built on Main Street.

To the five young men in the preparatory class, eight men and four women in the freshman class, six courses of instruction were offered: electrical engineering, domestic science, art, machine work and smithing, woodwork and pattern making, and normal manual training. By 1907 the school was offering additional bachelor’s degrees in mechanical, civil and chemical engineering.

Recognizing the need for a gymnasium, the students began a fund-raising campaign for the $11,000 needed to build one in town, spurred on by a $5,000 gift from the Clarkson family. By 1912, this second School building had been erected. That building became the library in 1956 after the new Alumni Gymnasium opened. When the library moved to the Educational Resources Center in 1978, the original building became the Liberal Studies Center.

When the New York State Board of Regents offered scholarships to qualified students attending college within the state in 1913, Clarkson’s Board of Trustees voted to change the school’s name to The Thomas S. Clarkson Memorial College of Technology; the head of the college became president instead of director; and John Pascal Brooks, a Dartmouth graduate, and one of the men on Walter Camp’s first All-American football team, became the first Clarkson director to bear the title of president.

Hockey began in 1921 on a rink behind Old Main, and soon moved to a bigger rink built by the students in Ives Park. Not until the hockey arena was completed on land across the river in 1938 did the team have a building in which to play. That facility was later named for the founding force behind Clarkson hockey, Murray Walker, owner of Weston’s Bookstore. Walker Arena provided home ice for Clarkson teams, which have frequently achieved national ranking, until Cheel Arena was completed in 1991.

Thomas Clarkson’s nieces, Miss Annie Clarkson and Miss Emily Moore, tried to have the entire school moved to a new campus on a hill outside of Potsdam (hence the nickname, the “hill campus”), with a gift of $1.5 million in 1929. However, because that money shrank to half a
million within a year due to the stock market crash, the plans for the move had to be shelved for over 30 years. Since then, the campus has moved almost entirely to the hill, although some administrative offices and the programs in health sciences remain on the original downtown Potsdam campus.

Responding to a plea from New York Governor Thomas Dewey after World War II, Clarkson admitted hundreds of returning veterans. Having no space to house or teach them by 1946, Clarkson rented the New York State School for the Deaf in Malone, N.Y., 40 miles east of Potsdam. For the next five years, freshmen and many sophomores spent their first two years in Malone before moving to the Potsdam campus for the remainder of their Clarkson education. That branch closed in 1951.

With that flood of veterans came the Trustees’ realization that the College would have to expand its facilities, and expand them it did over the next 20 years, adding not only facilities but graduate programs in engineering, science, and management, including PhD programs in most.

During that post-war period, and through the mid-1980s, Clarkson expanded both of its campuses, with many new residence halls on the hill campus, including Hamlin-Powers, the Quad, Moore House, Price and Graham Halls, Woodstock (originally planned for married student housing only), and the Townhouses. Beside them, it built the Educational Resources Center in 1978 and the added recreational facilities of the Indoor Recreation Center in 1980. The downtown campus also witnessed expansion during those years; Peyton Hall for chemical engineering, Damon Hall for civil, Clarkson Hall for electrical, and Lewis House for a student union. Clarkson also gradually took over Snell Hall from SUNY Potsdam for classrooms and office space.

In the fall of 1991, two significant developments occurred on the hill campus. Clarkson opened the CAMP (Center for Advanced Materials Processing) building, a research and teaching complex with state-of-the-art laboratories, designated a New York State Center of Advanced Technology. The building was connected to the existing Rowley Laboratories and, in the fall of 1996, all engineering departments were consolidated in the CAMP-Rowley complex.

Also in 1991, the University opened the Cheel Campus Center, a combination student union and hockey arena that includes dining areas, student government and activities rooms and offices, and a post office. In the fall of 1998, the University also completed a new Fitness Center, which connects the Indoor Recreation Center and Alumni Gymnasium.

In the spring of 1999, Clarkson Hall was renovated and rededicated as the Center for Health Sciences. This downtown facility now houses the University’s programs in Occupational Therapy, Physical Therapy, and Physician Assistant Studies. The newest academic building, Bertrand H. Snell Hall, opened on the hill campus for the fall 2000 semester. A wing of biochemistry laboratories was added to the Cora and Bayard Clarkson Science Center and opened in fall 2005. The Technology Advancement Center (TAC), an 18,000-square-foot addition connecting the Schuler Educational Resources Center and the Cora and Bayard Clarkson Science Center, was completed in fall 2008. A new Student Center was completed in August 2010 and connects all academic buildings.
DEGREE PROGRAMS

Bachelor’s Degree Majors
All bachelors’ degree programs at Clarkson require completion of 120 credit hours and the learning expectations of the Clarkson Common Experience. In addition to traditional discipline-specific degrees, Clarkson offers majors that combine work from at least two different fields so that students can broaden their areas of expertise.

A description of each degree program and its requirements can be found below. The Higher Education General Information Survey (HEGIS) code designated by the New York State Education Department for classifying these academic programs can be found in the list of degree programs and HEGIS Codes near the end of the catalog. Clarkson offers the Bachelor of Science (BS) degree in the following majors:

School of Arts & Sciences
- Applied Mathematics & Statistics
- Biology
- Biomolecular Science
- Chemistry
- Communication
- Computer Science
- Digital Arts & Sciences
- History
- Humanities
- Interdisciplinary Liberal Arts
- Interdisciplinary Social Sciences
- Mathematics
- Physics
- Political Science
- Psychology

Institute for a Sustainable Environment (ISE)
- Environmental Science & Policy
- Environmental Health Science

School of Business
- Financial Information & Analysis
- Global Supply Chain Management
- Business Intelligence and Data Analytics
- Innovation & Entrepreneurship
- Engineering & Management

Wallace H. Coulter School of Engineering
- Aeronautical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Environmental Engineering
- Mechanical Engineering

Interdisciplinary Programs
- Software Engineering
(See ISE for additional programs)

Program Length for BS and BE degrees is four years
Bachelor of Professional Studies (BPS)
In addition to the Bachelor of Science (BS) degree, Clarkson offers a Bachelor of Professional Studies degree program to provide flexibility and interdisciplinary study. The BPS enables a student to design and pursue an individual curriculum that meets personal career objectives. Programs may be designed in any discipline or by combining disciplines offered at Clarkson.

Double Majors and Second Clarkson Degrees
Undergraduates may also enhance an academic major by combining it with a second major. This may lead to a single bachelor’s degree with a double major or to two Clarkson bachelor’s degrees.

Minors
To complement and enrich bachelor’s degree programs, Clarkson also enables students to assemble coursework in designated minor programs. Such minors provide students with another area of specialization outside their major. Minors require 15 or more credit hours of specified coursework. Completion of an approved minor is indicated on a student’s transcript.

Humanities and Social Sciences also offer disciplinary minors and student-designed minors not in the below list. See Minors in Humanities and Social Sciences in the School of Arts & Sciences section of the Catalog or contact the chair of the Department of Humanities and Social Sciences at 315-268-6410.

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<td>Mathematics</td>
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Professional Concentrations
Undergraduate students may build an area of specialized expertise termed a professional concentration within — or closely related to — their degree program major. Such concentrations require at least 15 credit hours of coursework. Successful completion of a faculty-approved concentration is indicated on a student’s transcript. Course requirements vary and interested students should consult with academic advisers.

The following professional concentrations have been designated.

Arts & Sciences
Gender & Sexuality Studies (in the BS in Interdisciplinary Liberal Studies & BS in Interdisciplinary Social Sciences)

Engineering
Architectural Engineering
Biomolecular Engineering
Construction Engineering Management
Electric Power Engineering
Environmental Engineering
Materials Engineering
Structural Engineering

Engineering and Management
Global Supply Chain Management

Accreditation
Clarkson is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market St., Philadelphia, PA 19104-2680, 215-662-5606. The undergraduate programs in aeronautical, chemical, civil, computer, electrical, environmental, mechanical, and software engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. Students who have completed at least three years towards a bachelor’s degree in engineering are eligible to take the Fundamentals of Engineering examination toward licensure as professional engineers. The School of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB). The undergraduate engineering and management program in the School of Business is also accredited by the Engineering Accreditation Commission of ABET, Inc., http://www.abet.org. In addition, the University is accredited by the United States Civil Service Commission, and its curricula are approved by the New York State Board of Regents. All Clarkson degree programs are approved by the New York State Division of Veterans Affairs for the training of veterans and other eligible persons.
ACADEMIC PROGRAM OPTIONS
University Studies
Catherine Avadikian, Director

The University Studies Program was designed to serve those individuals who are ready to enter into their freshman year of college without making an initial commitment to a major field of study. It enables students to more fully investigate the full range of academic offerings relating to their specific academic and career interests. Note: Students registered under the University Studies umbrella are full-time matriculated undergraduates who have yet to designate a specific major area of study. In all cases, a selection of an academic major will occur prior to the end of the sophomore year.

Many students begin their studies without declaring a major. Frequently, their interests span over several disciplines and they need time to explore their choices. Students who enroll in the University Studies Program work with the Program Director to develop an individualized course schedule for the first year designed to facilitate exploration and keep all options open. This first-year program allows students the freedom to experience and familiarize themselves with degree programs and departments of study based on their individual interests and career goals.

The program is structured and designed to assist students in making a sound, educated, and well thought-out decision about an appropriate major. In the first year, students are placed in courses based on their interests and recommendation of their advisor so that within two semesters, they will be able to enroll in a major of their choice and still earn a bachelor’s degree in four years.

Additionally, students are encouraged to participate in professional societies and counseling activities that can help them define their academic goals and career-related objectives. Personalized academic advising is emphasized and students are directed to take full advantage of related services available to them at Clarkson.

For further information, try our undecided quiz, call the program office at 315-268-3948 or visit http://www.clarkson.edu/exploring.

Pre-Health Professions
Carolyn Zanta, Pre-Health Professions Advisor

Students may prepare for further professional study in medical (including Occupational Therapy, Physician Assistant, and Physical Therapy), dental and veterinary schools through any major at Clarkson. The University’s Health Professions Advisory Committee meets with students individually as they progress through their courses of study, providing guidance and advice in meeting University and departmental requirements and ensuring preparation for entrance into professional schools. For more information, contact the Chair of the Health Professions Advisory Committee at 315-268-3968 (see Degree Programs).
Students interested in preparing for entrance into Clarkson’s Doctor of Physical Therapy degree program should contact the Department of Physical Therapy at 315-268-3786. Students interested in preparing for entrance into graduate Physician Assistant programs should contact the Department of Physician Assistant Studies at 315-268-7942. Students interested in preparing for entrance into graduate Occupational Therapy program should contact the Department of Occupational Therapy at 315-268-2161.

**Pre-Law**
Joseph Andriano, and Christopher Robinson, Advisors

Students from many degree programs at Clarkson have entered law school. Educators agree that success in a law career depends more upon the development of skills and habits conducive to legal reasoning than a student’s specific major. Students planning to seek admission to law school should use elective courses to develop a broad cultural background; intellectual curiosity; and reading, writing and speaking skills. Students interested in law school may consider completing the Law Studies Minor.

Courses in business, engineering, and science help develop analytical skills and the technical background often helpful in understanding potential legal problems. Liberal Arts courses in the humanities and social sciences provide broad cultural background and the opportunity to develop analytical and verbal skills, since they entail a wide range of reading assignments, emphasize class discussion, and offer students the opportunity to prepare and criticize oral and written work.

Clarkson University and University of New Hampshire School of Law, Franklin Pierce Law Center, Concord, New Hampshire, have signed an articulation agreement for students interested in pursuing a law degree specializing in intellectual property law. Franklin Pierce Law Center is an internationally known school training specialists in patent law and other intellectual property fields.

Students admitted to Clarkson as first-year students can file a joint admission application with Franklin Pierce. When they complete their baccalaureate degree from Clarkson, they will be fully admitted to the Franklin Pierce Law Center providing they have a final undergraduate grade-point average of at least 3.25, an LSAT (Law School Admissions Test) score at or above the 75th percentile, and that they have not engaged in any intentional academic misconduct or criminal activity.

Pre-law advising is available for students in all majors to help them develop academic programs that will serve as a strong foundation for future legal studies. A list of pre-law advisors is available through the Dean’s Office in the School of Business at 315-268-2300. The advisors provide counseling and information about law schools and careers in law.

**Multidisciplinary Project (MP) and Multidisciplinary Team (MY) Courses**
Clarkson has developed courses to provide students with the opportunity to solve real-world design problems in a team-based multidisciplinary atmosphere. Often these courses culminate in national competitions. Such multidisciplinary project experience has been increasingly valued
by recruiters in the corporate marketplace. MP courses provide course credit, while MT courses carry no credit, but participation is recorded on the student's transcript.

TEACHER CERTIFICATION
Students sometimes wish to pursue studies preparing them for teacher certification while completing their major at Clarkson. The necessary courses are available via cross-registration through the Associated Colleges of the St. Lawrence Valley (Clarkson, St. Lawrence, SUNY Potsdam and SUNY Canton).

SUMMER SESSIONS
Clarkson offers two five-week summer sessions for undergraduates. A well-balanced offering of courses enables students to:
- participate in programs such as Cooperative Education or Study Abroad and still graduate with their class;
- enrich their academic program with electives that do not fit into the normal semester;
- take courses required for continuation in a specific program or transfer into a new area.

THREE-YEAR BACHELOR’S DEGREE OPTION
Students who have graduated in the top 10 percent of their high school class and who enroll in a Business or Arts & Sciences major may complete a bachelor’s degree in three calendar years. To satisfy this accelerated schedule, students apply Advanced Placement credits and/or work on special research projects during the summer.

OFFICE OF EDUCATIONAL PARTNERSHIPS (OEP)
The Office of Educational Partnerships (OEP) provides structure, coordination and support for the growing number of educational outreach programs on campus. A University-level effort to support educational outreach will help to improve our outreach offerings, our relationships with area school districts, and our ability to secure external funding for both education and research activities.

The role of universities in supporting the education of children in K-12 levels is becoming increasingly important. Professional societies, corporate foundations, and federal funding agencies recognize the need for University-school district partnerships and are offering funding directly for the development of partnerships and integration of University-level research efforts into the education of K-12 students.

Examples of these activities are the inclusion of K-12 students and teachers in proposed research activities, participation in the recruitment and training of K-12 math, science and technology teachers, and development of educational materials for students at all levels. Other major funding initiatives from the National Science Foundation, New York State and NASA, among others, require K-12 outreach as part of the education plan.

Numerous faculty at Clarkson University are currently involved with or interested in increasing their efforts in educational outreach. The Office of Educational Partnerships (OEP) provides training and advice, coordinates activities and acts as the primary liaison between the
University and area school districts. Institutionalization of the various current and proposed outreach activities will:

- Increase the effectiveness and coordination of Clarkson’s programs
- Provide a "clearing house" for proposed outreach activities that may be initiated at the University, or requests that may come from local schools
- Encourage more faculty members to become involved with such activities

**HONORS PROGRAM**
Jon Goss, Director

Clarkson offers an intensive, four-year undergraduate Honors curriculum for exceptionally talented students majoring in any of our degree programs. Applicants typically rank in the top 10% of their high school class, have excellent standardized test scores and demonstrate outstanding academic or leadership achievements. The Clarkson University Honors Program admits 50 or so new first year students and about 15 or so sophomore students per year. Students must maintain a grade-point average of 3.25.

The Honors Program complements work in the majors, emphasizing the development of problem-solving, teamwork, and communication skills. Students take one Honors course per semester. Courses develop as interlocking, multidisciplinary sequences, bring perspectives from different disciplines to bear on contemporary problems at the interface of science, technology and society. The approach is open-ended and project based. The four-year sequence comprises the following general topics:

- **First year** – Ethical Issues in Science, Technology and Society
- **Second year**– The Sophomore Project
- **Third year** – Ways of Knowing
- **Fourth Year** – Research and Modernity

The Honors Program also offers students opportunities to engage in original research through its summer research program. Students participate in cutting-edge research with faculty mentors, and the program provides board and room, research supplies and a stipend. This includes an abbreviated five-week “pre-frosh” program for entering first year students even before they matriculate at Clarkson. All students must also complete an Honors thesis based upon original scholarship conducted in the junior and senior year.

Finally, all Honors students must complete a service requirement. This is administered by students themselves who coordinate a wide range of service opportunities both on campus and in the local community.

Honors students enjoy many other benefits, including: The Honors Scholarship as part of their Clarkson financial assistance package; the Honors Educational Enhancement Scholarship that funds high impact extra-curricular activities; dedicated academic advising and a professional development program; and a residential learning community and interaction with students from a variety of academic areas.
The Honors Program at Clarkson is administered by an Honors Council comprising 12 faculty and administrators who represent a broad spectrum of academic interests and expertise, and six students who are elected by their peers. Contact Honors Director Jon Goss at 315-268-2290 or 2320, or through e-mail at honors@clarkson.edu for more information.

EARLY ENTRANCE COLLEGE PROGRAM: THE CLARKSON SCHOOL
Through The Clarkson School, the University offers a unique program for talented high school age students who are ready to begin college early. The Clarkson School provides a supportive residential community and dedicated advising that facilitates the transition to college life. The Clarkson School has been bringing such academically advanced students to campus since the fall of 1978.

Students who enroll in The Clarkson School live together on campus, with specially trained house advisors. Commuting day students from St. Lawrence County may also join the community. Clarkson School students are matriculated as University students and typically earn about 32 college credit hours during the year. Courses may be selected from the University’s offerings in the Schools of Arts & Sciences, Business and Engineering. With assistance from the school staff, students design their programs of study to meet their individual needs and interests.

The low student-staff ratio of The Clarkson School ensures individualized attention. Our orientation and advising program emphasizes the time-management and study skills that are essential for success in college. Each student’s progress is carefully monitored, and individualized help is provided where necessary. Personal development is considered an integral part of the program, and there are numerous structured activities that foster a cooperative living and learning environment. Monthly dinners are held to build a sense of community amongst the Clarkson School students and they are themed to address the needs of first year students. Students will enjoy guest speakers, discussions of future educational opportunities, and meetings with faculty mentors. Field trips are also an integral part of the program and they typically combine educational and community-building activities. The University’s clubs, activities and most sports are open to Clarkson School students.

Upon satisfactory completion of the year, students may automatically continue as sophomores at Clarkson University. The staff also provides guidance and help for those who wish to continue their education at other colleges and universities. In most cases, our students have been given credit and appropriate advanced placement at other institutions.

Costs of the Clarkson School are comparable to the cost of a year at Clarkson University, and financial aid and merit-based scholarships are available. Please note that students who elect to remain concurrently enrolled in high school and The Clarkson School are not eligible for federal student aid. Credit may be given for Advanced Placement or college courses taken in high school, dependent on scores or grades achieved.

Applying to The Clarkson School
The Admission Committee evaluates each applicant’s credentials with great care. In general, applicants accepted to The Clarkson School have demonstrated high levels of achievement in
their academic work, personal maturity, and engagement in extra-curricular activities. In order to determine whether a student is ready for the early college experience at The Clarkson School, we consider academic preparation as evidenced in the cumulative GPA, rank in class, standardized test scores, and the rigor of the curriculum the student has taken. A great deal of attention is given to the letters of recommendation to see if the writer feels that the student is prepared for the early college experience.

A completed application portfolio consists of: Clarkson School Application, Essay, Secondary School Report, official high school transcript, standardized test scores, and at least two letters of recommendations. There is a $50 Application Fee.

All potential Clarkson School students are strongly encouraged to visit the campus for an interview and campus tour. Students who interview with an Admission Representative for The Clarkson School will have their application fee waived.

The priority application deadline is June 1, but early application is recommended. Admission decisions are made on a rolling basis for students who have completed their Application Portfolio.

Please note that all students are admitted to the Clarkson School subject to policies and procedures set forth in the Clarkson School Admission guidelines.

To request an Application Portfolio or more information, call or write: Director of Admission, The Clarkson School, Clarkson University, - Box 5650, Potsdam, NY 13699-; telephone 1-800-574-4425 or 315-268-4425; email tcs@clarkson.edu. Interested students can also visit our web site at www.clarkson.edu/tcs for additional information, as well as access to our online application. The Clarkson School is a one-year program.

THE ASSOCIATED COLLEGES CONSORTIUM
The Associated Colleges of the St. Lawrence Valley was chartered in 1970 to stimulate a variety of cooperative activities among Clarkson University, St. Lawrence University, SUNY Canton, and SUNY Potsdam. With only 10 miles separating the four campuses, a significant amount of social, cultural and academic cooperation is possible.

Clarkson students have ready access to most resources at the other colleges. Special events are publicized through joint calendars and other means. Each of the four libraries permits students from all of the colleges to draw upon the total holdings of approximately one million volumes. (See Educational Resources Center.)

Students may cross-register for courses within the consortium, and some sharing of faculty takes place. To be eligible to cross-register, undergraduate students must be enrolled in at least 12 credits at Clarkson, excluding the cross-registered course, eligible students can to take up to two courses (not available at their home institution) per academic year totaling no more than 8 credits on a space-available basis at one or another of the campuses. An academic year for cross-registration includes the fall and spring semesters.
There is a special form and instructions for cross-registration available online at http://associatedcolleges.org/services/crossregistration.htm, or from the Associated Colleges office (267-3331 or acslv@potsdam.edu). The completed form is returned to Student Administrative Services.

Students will be enrolled as non-matriculated students at the host institution and the courses(s) will be transcribed at the host institution. At the end of the semester, an official transcript will be sent to the student's home institution and credit will be posted as transfer credit on their Clarkson transcript. Undergraduate students must receive a grade equivalent to a C (2.000) or higher at Clarkson. Grades in such courses are not used in computing a student’s GPA.

If cross-registration credits result in a course load requiring additional tuition charges, the student is responsible for those additional charges. Students are responsible for any special fees, such as lab fees, fees for registration, or transcript fees.
ACADEMIC REQUIREMENTS FOR UNDERGRADUATE STUDENTS

The Clarkson Common Experience
A Clarkson education prepares each student for today’s world and tomorrow’s challenges. All Clarkson students are required to meet the learning expectations of the Clarkson Common Experience. The Clarkson Common Experience integrates each student’s learning in a major field of study with learning expectations that broaden the student's understanding of our modern world. Each Clarkson graduate achieves objectives in fundamental academic abilities, in personal and social development, and in prescribed areas of knowledge.

Learning Expectations of the Common Experience
Each Clarkson graduate will achieve academic abilities that include:

- mastery of a major field of study,
- effective communication in oral, written, and technological forms,
- critical and imaginative thinking, and
- problem solving skills using both quantitative and qualitative reasoning where appropriate.

Each graduate is also expected to experience personal and social development that includes:

- an increased understanding of and insight into his or her own behavior,
- an appreciation of the need for self-motivated life-long learning,
- an increased social awareness and interpersonal competence, including an appreciation for the value of experiencing diversity, and
- an understanding of and recognition of the need for personal, societal, and professional ethics.

Knowledge is the essence of a university education, and each Clarkson graduate is expected to become knowledgeable beyond his or her major field in these areas:

- the nature of cultures and societies,
- contemporary and global issues,
- the imaginative arts and their role in society,
- science and technology, including their relationship to society and their impact on the environment,
- economic and organizational concepts and decision-making, and
- methods for studying and explaining individual and group behavior.

Components of the Clarkson Common Experience
The Clarkson Common Experience provides a common set of learning expectations and outcomes for all Clarkson students. To achieve these outcomes, each student is required to complete a set of courses and a professional experience. Course work consists of required and elective courses both from within a student’s major field and from across the spectrum of all disciplines in the university. Embodied in the Common Experience are four components that serve as common threads through multiple courses:
• learning to communicate effectively,
• developing an appreciation for diversity in both working and living environments,
• recognizing the importance of personal, societal, and professional ethics,
• understanding how technology can be used to serve humanity.

Each of these components is introduced early in the curriculum, reinforced in subsequent courses, and included in upper division courses.

The Communication Component: To develop excellent communication skills, Clarkson requires communication-intensive coursework, first in UNIV190, The Clarkson Seminar, then across the curriculum and in the major. Courses designated as writing intensive are assigned communication points on a scale of one or two (C1 or C2) to indicate the extent of communication experience in that course. Beyond UNIV190, The Clarkson Seminar, students must obtain six more “communication points,” at least two of them within the major at the 300/400 level. Communication points can be obtained by taking designated courses, or, with approval, through co-curricular experiences. Depending on initial abilities and background, students may also be required to enroll in a course that provides writing instruction and support for UNIV190, The Clarkson Seminar. Students for whom English is a second language must also meet the ESL requirements as described below.

The Diversity Component: From the moment they arrive on campus, Clarkson students prepare for the culturally diverse environments they will inevitably experience in their future careers. FY100, First-Year Seminar, helps students “respect and learn from Clarkson’s diverse community.” In UNIV190, The Clarkson Seminar, students will be urged to question their own assumptions and to consider different worldviews. Later in their academic coursework, students will gain a deeper understanding of cultural diversity within and among societies, recognizing how it influences their own actions and affects the lives of those around them. The Professional Requirement in the major area of study will prepare students to enter the global workforce by helping them understand the importance of diversity in the workplace.

The Ethics and Values Component: Through a repeated emphasis on ethics and values, Clarkson promotes in its students the profound reflection necessary to sustain personal, academic, professional, and civic integrity. Students are expected to view this process not just as an academic issue, but as critical for all aspects of their lives, including community activities, sports, student organizations, and work. Issues of personal ethics and values are addressed beginning with FY100, First-Year Seminar. Social and cultural values are discussed as part of UNIV190, The Clarkson Seminar. Several courses in the knowledge sequence emphasize social and cultural values or philosophical and ethical issues. In the Professional Requirement, students identify ethical problems in situations typically encountered within their professions and analyze these issues from different ethical perspectives.

The Technology Component: All Clarkson students are expected to understand the basis of our modern technological society and to gain an appreciation for both the potential benefits and limitations of technology. Students will be introduced to the basic knowledge necessary for understanding technology through two courses in mathematics and two courses in the natural sciences, including at least one with a laboratory component. A Technology Course is required
that reinforces this knowledge in the context of demonstrating how technology may be used to serve humanity. The interrelation of science, technology and society is studied in one of the knowledge area courses.

REQUIREMENTS OF THE CLARKSON COMMON EXPERIENCE

FY100, First-Year Seminar
First-Year Seminar treats personal and social adjustment topics as well as Clarkson values, ethics and diversity. [Fall semester] [Required only for first-year students.]

UNIV190, The Clarkson Seminar
The Clarkson Seminar welcomes first year students into a world of cultures, histories, and the global forces that will shape their personal and professional lives beyond their Clarkson education. Students will to define issues within a broad cultural context and gain experience in evaluating and interpreting texts. Seminar classes will be small and thematically structured, with an emphasis on discussion, critical reading and thinking, extensive writing, and collaborative work. [Fall Semester]

Knowledge Areas and University Courses
Students achieve learning outcomes in six broad areas of knowledge. Students are required to take at least five courses that have Knowledge Area designators, and the five courses must cover at least four of the six Knowledge Areas listed below:

- Cultures and Societies (CSO)
- Contemporary and Global Issues (CGI)
- Imaginative Arts (IA)
- Science, Technology, and Society (STS)
- Economics and Organizations (EC)
- Individual and Group Behavior (IG).

Additionally, at least one of these five courses must be a University Course that has two Knowledge Area designators. University Courses are multidisciplinary and address learning outcomes in two of the six areas of knowledge, and students observe and participate in the interaction of disciplines.

Mathematics, Science and Technology Courses
Students must achieve learning outcomes in basic mathematics, science and technology by completing five courses in these areas. Students develop quantitative literacy through the study of mathematics, including probability and statistics. Students must take two courses in mathematics as specified by the major. Students develop an understanding of the principles of science and technology through two natural science courses, at least one of which must have an integrated laboratory component. Students gain an understanding of how technology is developed through a Technology Course that addresses the theme of technology serving humanity.

Communication
Clarkson places a strong emphasis on developing students' abilities to communicate effectively in a variety of contexts using diverse forms of communication. Students must select coursework and possibly extra-curricular activities that carry a total of at least six communications points. Courses and activities with a communications component will be
identified as carrying either one or two points. At least two points must come from within the student's major discipline in a course at the 300 or 400 level.

**Major Field of Study**
A significant characteristic of the Common Experience is the integration of requirements from both outside and within a major field of study. Each student pursues a degree program in a major field and completes a set of prescribed courses to demonstrate mastery of that field. As part of these courses, students achieve outcomes of the Common Experience.

**Information Technology Expertise:** Students will gain expertise in using information technology and computational software appropriate to their major field of study.

**Communication:** Students must complete course work in the major field at the 300 or 400 level that includes discipline-specific communication for a total of at least two communication points.

**Professional Requirement:** The Professional Requirement incorporates learning outcomes involving professionalism, ethics, and diversity. These outcomes include understanding the concepts of professionalism, professional responsibility, and professional ethics, and knowing how the student's professional community promotes, supports, and enforces these concepts. Students should develop an appreciation for the value of diversity in the workplace.

**Professional Experience:** All students participate in a project-based professional experience following the first-year such as co-op, internship, directed research, or community project clearly related to the student's professional goals.

**Bachelor's Degree Graduation Requirements**
1. At least 120 credit hours.
2. At least a 2.00 cumulative average.
3. At least a 2.00 cumulative average in the major field of study for the Class of 2004 or later.
4. Meet the requirements of the Clarkson Common Experience.
5. Meet the requirements for a degree program as determined by the offering department or school.
6. A student entering as a first semester freshman must have been in residence for at least four semesters, including the final undergraduate semester; or, if entering with advanced standing, have completed at least half the remaining upper-level undergraduate work in residence at Clarkson. The program must include a minimum of two semesters (30 credit hours) including the final undergraduate semester.

**EAP/ESL Requirement**
Students for whom English is a second language must take an English language placement examination upon entering Clarkson. Based on the outcome of this examination, a student may be required to complete one or more English for Academic Purposes (EAP, formerly ESL) courses prior to enrolling in UNIV190, The Clarkson Seminar, or any course assigned one or two communications points.
NOTE that international students who enter as first-year students and are placed in EAP course(s) may substitute another course for UNIV190, The Clarkson Seminar. The substitute course (1) must have a C1 or C2 designation and (2) must have at least one of the Knowledge Area designators (CGI, CSO, EC, IA, IG, STS) and come from the humanities and/or social science disciplines. The substitute course must be IN ADDITION TO the 5 required Knowledge Area courses.

Grading System
Grades are reported in accordance with the following system:

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<td>Passed with 4.000 quality points per credit hour</td>
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<tr>
<td>A</td>
<td>Passed with 4.000 quality points per credit hour</td>
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<tr>
<td>A-</td>
<td>Passed with 3.667 quality points per credit hour</td>
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<tr>
<td>B+</td>
<td>Passed with 3.334 quality points per credit hour</td>
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<tr>
<td>B</td>
<td>Passed with 3.000 quality points per credit hour</td>
</tr>
<tr>
<td>B-</td>
<td>Passed with 2.667 quality points per credit hour</td>
</tr>
<tr>
<td>C+</td>
<td>Passed with 2.334 quality points per credit hour</td>
</tr>
<tr>
<td>C</td>
<td>Passed with 2.000 quality points per credit hour</td>
</tr>
<tr>
<td>C-</td>
<td>Passed with 1.667 quality points per credit hour</td>
</tr>
<tr>
<td>D</td>
<td>Lowest passing grade with 1.000 quality points per credit hour</td>
</tr>
<tr>
<td>F</td>
<td>Failed with 0.000 quality points per credit hour</td>
</tr>
</tbody>
</table>

Therefore, a student who passes a 3-hour course with an A will earn 3 x 4.000 or 12.000 quality points; an A-, 3 x 3.667 or 11.001 quality points, etc. The quality-point average is determined by dividing the total number of earned quality points by the total number of credit hours taken at Clarkson on a traditional basis (A+, A-, B+, B, ...). Selected courses may be taken on the Pass/No Credit system where P=passed, quality-point average not affected; NC (no credit) on student’s record for C-, D, or F grade in courses taken as Pass/No Credit; P=passed (certain designated graduate courses), quality-point average not affected.

ACADEMIC STANDING

1. **Academic Warning.** A full-time undergraduate student in Good Standing whose current semester Quality-Point Average (QPA) falls below 2.000 shall be placed on Academic Warning. To be removed from Academic Warning, back to Good Standing, a student needs to complete at least 12 credit hours with a current semester QPA of at least 2.000.

2. **Academic Probation.** A full-time undergraduate student on Academic Warning who fails to complete at least 12 credit hours with a current semester QPA of at least 2.000 will be placed on Academic Probation. To be removed from Academic Probation, back to Academic Warning, a student needs to complete at least 12 credit hours with a current semester QPA of at least 2.000.
3. **Academic Separation.** A full-time undergraduate student on Academic Probation who fails to complete at least 12 credit hours with a current semester QPA of at least 2.000 will be separated from the University. Any undergraduate student who fails to attain a current semester QPA of at least 1.000 shall also be Separated from the University.

4. **To be continued, if Separated,** an undergraduate must request continuance by submitting a Request for Continuance form available in PeopleSoft. Former students who have been away from Clarkson for at least one semester following an academic separation must request readmission by submitting a [Request for Readmission Following Separation](http://www.clarkson.edu/sas/student_records/documents/requestafterseparation.docx) form one month before the beginning of the semester the student wishes to return to the Continuance and Readmission Review Committee at the following e-mail address: registrar@clarkson.edu. The student needs to complete all answers on the form and provide the program(s) of study the student wishes to be continued in. All cases of continuance require approval of the University’s Continuance and Readmission Committee. If continued, a student’s academic standing will be Academic Probation.

5. The academic standing acquired at the end of any semester shall take effect at the beginning of the next summer school or semester in which the student enrolls.

Further information may be found by contacting Student Administrative Services.

**Dean’s List and Academic Scholar List**
To qualify for the Dean’s List during any semester, a full-time undergraduate student must receive no failures and earn a semester quality-point average of at least 3.250. A 3.800 semester quality-point average or better qualifies a student for the Presidential Scholar List. Both lists require a student to be enrolled for at least 14 credit hours in a prescribed curriculum of which 12 or more credit hours are graded in the traditional manner (not graded on a pass/no credit basis).

**Degree with Distinction**
A student will receive the bachelor’s degree "with distinction" if his or her cumulative quality-point average is at least 3.250, and "with great distinction" if it is at least 3.750. A more detailed and complete explanation of all academic and graduation requirements at Clarkson appears on the Web at www.clarkson.edu/.

**Double Major and Second Degree**
- A single Clarkson bachelor’s degree with a double major is awarded when the student satisfies all curricular requirements for two Clarkson bachelor’s degree programs, but does not qualify for a second degree.
- A student can be awarded two Clarkson bachelor’s degrees. A student qualifies for a second Clarkson bachelor’s degree if he or she satisfies all degree requirements for two different Clarkson bachelor’s degree programs and has a minimum of 150 credit hours, including at least 30 credit hours unique to each program.
STUDENT AFFAIRS

About the Division of Student Affairs
The Office of the Vice President for Enrollment and Student Advancement oversees the areas of the University that have a significant impact on student life. The staff is committed to assisting students with the many adjustments they face during their college years. The Student Affairs team works closely with student leaders, student groups, and individual students to assess student needs and develop programs and services to meet those needs. We view university life as a total educational experience, encompassing the ongoing activities and programs offered in residence halls, clubs and organizations, special campus events, and experiential programs both on and off the campus. Our students are always expected to behave in ways that are mindful of safety and civility, respecting and celebrating the many differences they find among one another. The Student Affairs staff members at Clarkson are educators in their own right and work to build bridges between the faculty and students and the outside world in new and creative ways. Clarkson students become part of a dynamic and diverse community of scholars and will grow and develop as individuals within that community as they prepare for their futures.

Mission
- Student Affairs is a catalyst for bridging diverse academic, cultural, professional and social experiences, empowering students to achieve their full potential.
- We promote intellectual, personal and professional growth through the delivery of developmental opportunities in a collaborative and respectful campus community.
- We enhance campus community interaction and facilitate co-curricular educational activities as well as provide global, pre-professional and leadership experiences.

About the Campus and Greater Community
Clarkson is a residential university, with the majority of students residing on campus. Other students live in fraternity or sorority houses or apartments in the Village of Potsdam. Being a student at Clarkson means entering into “community” at several different levels. Broadly speaking, there is the learning community that encompasses the full experience of living and studying on the Clarkson campus, accompanied by the pleasures and responsibilities of being an integral part of a relatively small college town. However, small and sometimes powerful communities often develop within the floor of a residence hall; or among a group of laboratory partners; or among the members of a campus club. A Clarkson education encompasses far more than classroom and laboratory activities, studying, and grades. It is a total experience that includes building new relationships, finding out more about oneself, clarifying career and personal goals for the future, and learning how to be a participating member of a society that constantly strives to be better.
Clarkson students work hard. The University’s standards are high, the courses challenging, and the time full. Sometimes it can be quite demanding. But we also know from thousands of our alumni — as well as current students — that they take great pride in having worked hard for a quality education that pays off for them in many different ways. In addition to providing each student with a strong academic program, Clarkson is committed to helping its students develop personally and professionally. Your learning experience will reach well beyond the traditional classroom and laboratory setting. An essential part of your educational experience will emerge through the programs and activities in which you participate. Another characteristic that we see in our students is a strong desire to make the world a better place, and we try in many different ways to encourage involvement in and service to the surrounding community. To be able to find ways of giving back to our communities is truly the mark of a responsible and independent adult.

**Parent Relations**
The Parent Relations area of the University is housed in the office of the Vice President for Enrollment and Student Advancement. Clarkson is committed to a parent relations program that partners with parents and educates them to the many services and programs available to their students.

The Parents Association was founded in 1977 to foster a closer relationship and to involve a greater number of parents in the affairs of the University. All parents become members of the Association upon the acceptance and enrollment of their children into the University and can remain members indefinitely.

The administration of the Association is vested in the Parents Committee, which consists of parent representatives from all four class years of students, as well as the graduate students. The Parents Committee works closely with the office of the Vice President for Enrollment and Student Advancement and the staff of the division in planning programs and events that support parent involvement and interaction. The Committee specifically helps with Family Weekend planning and activities, with the Admission Office recruitment of prospective students, and with the Career Center’s employer relations programs. The Parents Committee also has a role in the fundraising arm of the University through contributions to the Parents Fund.

The relationship between students, parents and the University is an important one. Through the Parent Relations area, communication is encouraged in order to foster a better understanding among parents, students and University staff.

**New Students and Orientation**
Students approaching their first year at Clarkson know that they have been accepted to an academically selective institution, yet the atmosphere at the University is friendly and supportive, one in which students go out of their way to help each other succeed. Our students learn the importance of an individual’s contribution to successful teamwork in the completion of any project. This gives the Clarkson graduate experience and insight into the significance of developing intellectual and interpersonal skills simultaneously.
The first year at Clarkson is structured to help students in their academic, personal, and social adjustment to college and to their future. Clarkson’s concern for new students begins even before they arrive on campus. Over the summer, the University sends first-year students an array of information about life and traditions at Clarkson, from materials concerning housing assignments and roommates, to information about arrival times and the Orientation Program.

**Orientation**
New Student Orientation is a comprehensive introduction to Clarkson University. The program helps students build a foundation for academic and co-curricular success. Orientation provides numerous opportunities to find out all about life at Clarkson from a personal, social, and academic standpoint. It is a time for learning about Clarkson traditions, appreciating the value of the University’s celebrative community, and learning about ways to serve in the larger community. Clarkson’s co-curricular opportunities, resources, and services for students are highlighted, and new students are introduced to Clarkson’s academic programs through academic orientation in their departments, a book discussion of the common reading, team building activities, and plenty of entertainment. Evenings during Orientation consist of events such as screenings of the summer’s most popular blockbuster movies and variety shows like hypnotists and comedians. Through the Orientation experience, students will build relationships with other students, faculty, and administrators. Students may also choose to become involved in a pre-Orientation trip as a way of being introduced to Clarkson life before the comprehensive Orientation Program begins.

**Adjusting to Life at Clarkson**
To assist new students, every first-year residence hall floor is assigned a resident advisor. The upper-class student staff are trained to ease the transition from high school and home to college.

Once classes begin, campus life takes on an identity of its own. Students begin to adjust to a new and different schedule, to new academic performance expectations, and to an entirely new way of life. Some adjust more easily than others. For those who need assistance with academic, personal, or social concerns, there are a number of possible routes available. The Health and Counseling Center represent one possibility. The people there are trained to assist students in every aspect of their daily lives: stress management, interpersonal communication, personal issues, etc. The Counseling staff can help find a solution to a problem, or can find someone else to help. In addition, there are a variety of offices listed below that can help students address academic and social concerns that may arise during the transition to Clarkson.

**First-Year Transition**
The Office of Student Life and Engagement, Clarkson Union Board (the campus’ student programming board), Residence Life staff, and clubs and organizations take over where the First-Year Seminar (described below) ends. These offices and organizations plan and coordinate a number of activities and co-curricular programs open to all students. Activities such as a trip to Ottawa for Winterlude or opportunities to attend renowned speakers and entertainers are usually offered by one of these groups. Whatever one’s taste, there is probably a program to satisfy it. If not, each of these groups is either student-run or has student representatives to
help plan and implement desired programs. In any major, the first-year curriculum at Clarkson is challenging. All first-year students take the Clarkson seminar, which addresses important questions around a central theme. In each school, common coursework in the first year makes it easy to change majors if the academic interests change.

To assist in the transition to Clarkson’s academic program, first-year students are encouraged to live with others around a common theme interest, whether it is academic or recreational. Resident Advisors help students living in theme housing with their academic and social transitions to Clarkson. They do this by helping to identify tutoring needs and resources, helping to organize social and leadership events and just generally being available to assist students. Students living in themed housing are encouraged to study and learn together and to develop mentoring relationships with faculty.

Students may seek help with their academic work through the Student Support Services area, their instructors, or the department in which a course is offered. Group tutoring sessions are organized for many first-year courses.

It is part of the challenge of the first year to learn to strike a healthy balance between an academic program and a social life. Clarkson is ready to help, and the University staff is experienced at supporting students in their efforts to succeed. The help is there for the asking — and is all part of the supportive environment that is the experience of being a first-year student at Clarkson.

**Student Diversity and Inclusion**
Cathy McNamara, Associate VP of Student Success, Diversity, & Inclusion

The office of Student Success, Diversity and Inclusion (SS, D & I) was created in April, 2015 as part of the university’s vision to create a community whose organizational units would support initiatives focusing on inclusion, employee development, and an enhanced culture. Changes that were announced by President Collins were:

SS, D & I collectively houses units that are leading campus-wide efforts to strengthen and develop key initiatives to support diversity objectives related to student access, academic success, campus involvement, and leadership development that will ultimately lead to career success and lifelong engagement with Clarkson.

The mission of the Student Success, Diversity and Inclusion organization is to serve and embrace all students. We are committed to providing access and opportunity programming for student success. Using a collaborative approach, we provide academic monitoring and advisement, student engagement, professional development opportunities and support retention initiatives to graduate culturally competent students.

The following outlines the work by the respective areas now housed under the umbrella Student Success, Diversity & Inclusion. The central office (Student Success Center) houses the Associated Vice President/Director of Student Support Services (SSS) which leads the strategic direction of the office and the programs within and joined by the following dedicated Directors:
Enrollment is the crucial first step toward achieving a diverse community. Funding streams that support access to Clarkson — scholarships, specialized admissions programs and K-12 outreach programs and summer camps — are crucial to meeting our goals of expanding the world reach and diversity of the Clarkson community and to supporting our commitment to creating a university for the 21st century.

A transformative campus experience, which incorporates and supports aspects of academic success, campus involvement, and leadership and professional development opportunities, will positively affect retention and is the vital link to future career and personal success as well as lifelong engagement with Clarkson.

Clarkson Intercultural Ambassadors (CIA):
Led by the Office of Multicultural Student Affairs, the Clarkson Intercultural Ambassadors are a group of carefully selected and trained Clarkson University students, whose work centers on increasing the cultural competence of the Clarkson University community as a whole. Clarkson University Intercultural Ambassadors implement and organize globally focused programs and initiatives that educate the Clarkson University community on issues related to broadly defined areas of diversity, including race, ethnicity, sexual orientation, gender, socio-economic status, religion, etc. These students also serve as catalysts for change within the student body to ensure that they are prepared for the realities of a diverse workforce as future members of an ever-increasing global society.

In the Fall we were able to train 36 CIA members. They facilitated over 30 workshops and worked with the freshman class on Civic Engagement projects. They successfully implemented a “Tough Talk” series. The Tough Talks are weekly conversations about things people usually shy away from in conversation (i.e. race, religion, slurs).

CU Connect Mentoring:
A university wide mentoring program in which every student is connected with a staff or faculty member in the first week of school to help with the transition to college. Under represented students’ mentors are hand selected from over 80 volunteers to mentor students who are strategically placed within our campus community.

Horizons:
Horizons is intended to help young women embrace and apply the excitement of mathematics and engineering. The Horizons curriculum uses an integrated instructional module for mathematics, science, and engineering concepts and supports these through fun and challenging hands-on projects. The life skills component further enhances the instruction as
participants build confidence, personal insight, leadership, and team spirit in an emotionally scuffled learning environment. Approximately 330 participants in grades 8, 9, 11, & 12 enroll each summer.

**Professional Societies:**
- American Indian Science and Engineering Society (AISES)
- Minority Association of Pre-Health Students (MAPS)
- National Society of Black Engineers (NSBE)
- Society of Asian Scientists and Engineers (SASE)
- Society of Hispanic Professional Engineers (SHPE)
- Society of Women Engineers (SWE)
- Unconventional Professionals

**Veterans Success Program:**
Clarkson University Veterans Success Program, voted the 6th year in a row as Military Friendly College and Military Advanced Education Award is designed to support our veteran students from the admissions process to Career Placement.

**Men’s Group:**
Men’s Initiative Group has organized invitations to our male students to meet once a week. This peer to peer group will provide a brave space for students to engage in open dialogue. The group will also participate in different types of workshops that will contribute to their academic success. We have also recruited alumni that will act as mentors to the students in the upcoming semester.

**Student Support Services:**
Trio grant funded by the Department of Education to serve 160 students who hail from low-income/first generation or students with disabilities. The persistence rate meets and often exceeds 94% and graduation rate meets/exceeds 83%.

**First Year Advising/University Studies First-Year Advising**
It is not unusual for students to experience many changes in their first year on campus, and we provide resources to help them. Academic advising is an important function of Clarkson’s faculty and staff. Although all students have a faculty or professional administrative advisor within their academic programs of study, an added service offered by Clarkson is First-Year Advising for students who want extra guidance, want to tailor their education to pursue multiple interests, or are still deciding on a major or career direction.

**Clarkson University’s Arthur O. Eve Higher Education Opportunity Program:** Clarkson’s Higher Education Opportunity Program (HEOP) provides a wide range of services to New York State residents, who because of academic and economic circumstances would otherwise be unable to attend and complete a college education. Furthermore, HEOP at Clarkson University enriches our campus community with a diversity of backgrounds and ideas to enhance the overall educational experience for all. This in turn, provides all with a greater sense and awareness of the ever increasing globally diverse workforce and economy. Moreover, Clarkson
University’s HEOP program emphasizes recruitment to include American Indian and rural youth in addition to African American males, Latino students and women who are among the most disadvantaged populations with respect to achieving degrees in Science, Technology, Engineering and Mathematics (STEM).

The Community of Underrepresented Professional Opportunities (CUPO):
The CUPO office is the shared home to the Collegiate Science and Technology Entry Program (CSTEP), the Ronald E. McNair Post-Baccalaureate Achievement Program (McNair), the Louis Stokes Alliances for Minority Participation Program (LSAMP), and the Academic Success Program to Improve Retention and Education (ASPIRE). The creation of this office brings together four long-standing federal and state Department of Education and National Science Foundation programs in one location, providing ease in access to services for students. The CUPO office provides academic enrichment and support, graduate school preparation, career and professional development, research opportunities, and social and cultural experiences for eligible students.

CUPO Collegiate Science and Technology Entry Program (CSTEP):
Funded to serve 80, the purpose of CSTEP is to increase the number of historically underrepresented and economically disadvantaged students pursuing careers in STEM fields or NYS licensed professions. CSTEP is sponsored by the New York State Education Department. Clarkson's Collegiate Science and Technology Entry Program (CSTEP) has been in existence since 1994 and has served over 400 students.

The CSTEP program helps to assure a competitive advantage to eligible students by providing academic support, enrichment activities, career development, and graduate school preparedness. Students are provided with academic guidance and tutoring. Along with this, the office provides academic success workshops and a lending library of textbooks laptops and other important tools for success.

The CSTEP staff helps students meet the challenges of the competitive STEM field by offering career guidance and skill building that will help students identify and prepare for a career. Students are given opportunities to participate in activities such as conferences; networking with corporations, other colleges and universities; as well as meeting with Clarkson University alumni. This builds their career network, and may lead to becoming involved with research, co-op, study abroad, or internship opportunities. CSTEP offers assistance with various graduate and professional exams, and with applying to graduate schools when approaching the end of baccalaureate degree requirements.

CUPO Community College Recruitment:
In Early spring semester we host a group of OCC and MCC students (CSTEP & LSAMP) at Clarkson. While on campus we provide a tour, a transfer admissions information session, and meetings with faculty, speed teams, student organizations, and our Student Success Center. The visit ends with a student panel, food and game night, and an overnight stay with current CUPO students.
**CUPO Summer Research and Summer Research Transfer Initiative**
CUPO provides a 10 week paid faculty guided summer research program. The main focus of participants is to attend workshops designed to explore the graduate school application process, prepare for the GRE exam, visit graduate schools, obtain faculty and peer mentoring, and to access opportunities to present research locally and at national conferences.

**CUPO Ronald E. McNair Post Baccalaureate Achievement Program (McNair):**
The McNair program, a federal TRIO grant funded by the US Department of Education, serves 30 students per year. Participating in the program allows students firsthand experience in cutting-edge research with faculty member mentors who are dedicated to their teaching and research.

Clarkson’s research for McNair Scholars focuses on STEM disciplines. Students in McNair complete a 10-week intense research program, filled with graduate school workshops, GRE preparation, and seminars by alumni and faculty with PhD’s. Students present their research at a national McNair Conference and at Clarkson’s summer SURE Symposium.

The goal of the McNair program is to have historically underrepresented and economically disadvantaged, first-generation college students enter graduate school and attain a PhD.

**CUPO Louis Stokes Alliance for Minority Participation Program (LSAMP):**
LSAMP is a program aimed at increasing the quality and quantity of African, Latino, Asian, and Native American (AALANA) students successfully completing science, technology, engineering and mathematics (STEM) baccalaureate degree programs, and increasing the number of AALANA students matriculating into graduate programs. The program goals are accomplished through the formation of alliances. The Consortium is comprised of seven institutions: Syracuse University (the lead institution) and Clarkson University, Cornell University, Rensselaer Polytechnic Institute, Rochester Institute of Technology, and Monroe and Onondaga Community Colleges.

**CUPO The Academic Success Program to Improve retention and Education (ASPIRE):**
The ASPIRE program provides a four-year scholarship to approximately 60 students who qualify as academically talented, economically disadvantaged, and underrepresented students in STEM. The purpose of ASPIRE is to increase the number of eligible students graduating, attending graduate school and/or obtaining employment in STEM fields.

The ASPIRE program is funded by the National Science Foundation (NSF). ASPIRE emphasizes the importance of recruiting students in STEM disciplines and supporting students through degree completion. ASPIRE has a strong focus on research opportunities, professional development, and partnering with employers to facilitate student career planning of the STEM workforce.

**CUPO CORE (College Opportunities for Retention and Engagement):**
CORE Peer Mentoring connects freshman and sophomore students by pairing with junior and senior mentors. Our mentors are trained to offer support, insight and friendship, helping students to adjust and be socially and academically successful.
CUPO Annual Northern NY Career Exploration Symposium:
This annual symposium provides students an opportunity to hear from professionals in STEM fields about their personal experiences and opportunities that exist in their field of expertise. In addition, the symposium offers an opportunity to network with professionals and make important connections toward employment goals. The event is rotated yearly between the 4 colleges CSTEP/STEP programs in the North Country (Clarkson, St. Lawrence, SUNY Potsdam and SUNY Canton).

CUPO Advisory Board:
The CUPO Advisory Board provides a leadership role for CUPO students. Students meet several times each semester to discuss programming activities for CUPO. They are the student voice in the CUPO program and each semester plan several community building activities for CUPO students as well as giving insight and input into the initiatives and programming the CUPO office initiates.

First-Year Seminar, FY100
This freshman seminar introduces students to Clarkson University’s mission where we “strive to attune ourselves and our programs to our global, pluralistic society”. Through project-based learning, students engage in research and dialogue with the intention of developing a set of behaviors and attitudes that create a sense of belonging for each participant and enable them to work effectively in diverse situations. Classroom discussions, facilitated by guest speakers and Peer Educators, are designed to promote self-reflection, constructive dialog, and improved communication skills. The aim of First Year Seminar is to aid in the development of citizens attentive to our campus, local, national, and world community needs.

CLARKSON HOUSING
Clarkson is a residential university. Single undergraduate students in cohort years 1, 2, 3, and 4 are required to live in University housing and dine in campus facilities unless they are granted an exemption to the residency requirement listed in the policies. Fifth-year students are housed on campus only as space allows. Junior and senior fraternity and sorority members who meet academic requirements may live and dine in University-recognized fraternity and sorority housing. Upper-class fraternity and sorority members living in residence halls may be permitted to take their meals at their respective fraternity or sorority houses.

University housing provides accommodations ranging from traditional rooms to suites to apartments. Most first-year students reside together in Cubley-Reynolds and Ross-Brooks (Quad). Special attention is given to the assigning of roommates to first-year students. Some of our housing units feature suite-type accommodations; these are typically 2 double rooms with interconnecting baths. Lounges and recreational areas, laundry rooms, and vending machines are located in or near each residence facility. Campus housing is staffed by live-in University employees known as Area Coordinators, who supervise and train students as resident advisors and directors to assist the students with personal issues and a variety of educational, social and recreational programs. Smoking is not permitted in any buildings on campus including the residence halls.
Students living in campus housing are required to contract for food service, eating their meals in a University dining venue of their choice (exceptions are campus apartment residents).

In addition, the University operates three on-campus apartment complexes. All units are furnished with kitchen facilities and include utilities. Students in a campus apartment are not required to contract for food service, however, they may do so. Students residing off campus have the option of contracting for University food service. Telephone service, TV cable, and data lines are available for students in each room or apartment. A separate charge may be associated with telephone service and/or TV cable.

Students are responsible for knowing and adhering to the Residence Regulations enumerated in the University housing contract and on the University's web site.

**Theme Housing**

Consistent with the Residential Experience initiative of the University Outreach and Student Affairs Strategic Plan, Clarkson is striving to bring all aspects of Clarkson’s learning community together by developing innovative theme housing opportunities to complement and build on current theme housing created around projects or entrepreneurial ventures in which students from various majors live and work together. In addition, students will continue to be encouraged to develop meaningful proposals for living together in theme-related housing, thereby increasing options for people with similar interests to live together while expanding the collaborative learning atmosphere to our residences in a very intentional way.

**Campus Safety & Security**

The Office of Campus Safety & Security consists of a team of people working with the campus community to meet the specialized safety and security needs of the University. Responsibilities include the maintenance of public order, vehicle registration, emergency first aid treatment, issuing I.D. cards, room key distribution, educational programs (including crime prevention and fire safety), and other related programs.

Campus Safety & Security officers are responsible for the enforcement of the rules and regulations of the University. The Dean of Students staff is responsible for overseeing the judicial process. Officers do not have police jurisdiction over public streets, public property, or private property. Arrests and apprehension are referred to the Village Police. Statistics concerning campus safety and campus crime are available upon request from the Office of Campus Safety & Security or can be accessed at http://www.clarkson.edu/campussafety/.

The department’s ability to function as an independent agency enables it to preserve the tradition of Clarkson in which security, safety, and adherence to the Code of Student Conduct are both an individual responsibility and a collective behavior. In emergencies, Village Police are called as first-line, back-up support, along with appropriate University officials and the University Emergency Response Team.
Clarkson Regulations
By the time students enter the University they are considered to be adults and are expected to act accordingly. Each student is responsible for knowing the contents of Clarkson Regulations, found at www.clarkson.edu/studentaffairs/regulations. The regulations contain information on registration, class absences, the grading system, scholastic requirements, the method for removing course deficiencies, special examinations, the code of conduct, campus policies, and other information regarding University operations. Printed copies of Clarkson Regulations can also be obtained from the Office of the Vice President for Enrollment and Student Advancement.

Extracurricular Activities and Student Life
There are many opportunities to enhance the educational experience through participation in a range of extracurricular activities. The University recognizes the importance of these activities in developing qualities of leadership and personal growth. To find out when student groups are meeting and what activities are happening on campus go to http://KnightLife.clarkson.edu and check your e-mail every Thursday to see what is happening that weekend and the following week. Your college experience will be richer if you are an active participant in it.

Clarkson Union Board
The Clarkson Union Board (CUB) is the campus’s programming board. Through its dedicated student members, CUB provides cultural, social and recreational programs that complement academic life of the campus. The CUB executive committee consists of a president, vice president, secretary and treasurer. Committee chairpersons join with the executive committee to complete the Board. The Clarkson Union Board sponsors comedians, magicians, hypnotists, movies, special events, concerts and a major annual concert titled Spring Fest. Past Spring Fests have boasted performances by the Goo Goo Dolls, the All American Rejects, Panic! At the Disco, Plain White T’s, and more.

Clarkson University Student Association (CUSA)
CUSA Senate is the governing body of all clubs and organizations on campus. They are responsible for allocating the activity fee each semester to sponsored clubs and organizations. Composed of a president, vice president, comptroller, public affairs director, treasurer and secretary (the Executive Board), six Senators from each class, and a Clarkson School representative, the CUSA Senate serves as the formal representatives of the student body. The CUSA Senate is responsible for working together with the Clarkson Administration on all decisions that affect the student body. Senate meetings are held on Monday at 7 p.m. in the Student Center. Committee meetings are held at various times throughout the week. Meetings are open to all students.

Community Service
Each year, a Volunteer Fair is held on the first day of classes. Volunteering and community service can be one of the most fulfilling opportunities you’ll find at Clarkson. By reaching out and offering your energy, talent and compassion, you can make a real difference in people’s lives. Through service to others, you will gain a better understanding of yourself, demonstrate classroom learning, and increase leadership, teambuilding and management skills. That’s why
Service is a core value of Clarkson; it benefits both the students and the community. Service helps develop a sense of social responsibility and civic pride. Potsdam has a number of service institutions, agencies and organizations that welcome volunteer assistance. Some members of the Clarkson faculty are building opportunities for service learning into the structure of their courses. This enables students to receive partial academic credit for working on community needs and problems relevant to their academic fields. One of Clarkson’s fundamental values is to develop the kinds of skills in students that will enable them to make contributions toward the betterment of the local and global community. For information about volunteer opportunities on campus and information about local organizations that are seeking volunteers in Potsdam, visit http://clarkson.edu/campus_life/clubs/volunteering.html.

Service Organizations
There are special organizations dedicated specifically to community service. They are open to all undergraduate students. Alpha Phi Omega national service fraternity, consisting of over 615 chapters across the United States, is one of the largest fraternities in the country. Founded in 1925, Alpha Phi Omega was established to promote leadership by providing services to benefit the campus and the community. Alpha Phi Omega is open to all students. Clarkson also recognizes active chapters of Circle K, whose members become involved in numerous community service projects.

Cultural and Recreational Opportunities
The Clarkson community has easy access to many cultural and recreational facilities in upper New York state, New England, and Canada, as well as on the campus.

Among New York State attractions are the Adirondack Museum at Blue Mountain Lake, the Remington Museum at Ogdensburg, the Thousand Islands resorts near Alexandria Bay, and the St. Lawrence Seaway area near Massena.

Skiing is available at slopes around Lake Placid, Tupper Lake, Vermont, and New Hampshire, which are easily reached by automobile, as are excellent locations and facilities for fishing, boating, hiking, tennis, and golf.

Splendid concentrations of cultural activities abound in nearby areas of Canada. Within 96 miles is the Canadian capital of Ottawa, with its National Arts Centre, National Gallery of Canada, Museum of Civilization, Museum of Science and Technology, Museum of Nature, Ottawa Senators hockey team, and the Parliament complex. Within 150 miles are Montreal’s Museum of Fine Arts, Place des Arts, several educational institutions, and a professional hockey team, the Canadians. Just across the border near Cornwall is Upper Canada Village, a reconstruction of the living style of United Empire Loyalists who sought refuge in Canada following the American Revolution.

In Potsdam itself, music lovers have excellent opportunities to hear orchestral, choral, and solo performances by teachers, students, and visiting artists at the noted Crane School of Music at SUNY Potsdam.
Fraternity-Sorority Life
About 15 percent of Clarkson’s students join fraternities and sororities. The locals, in order of their founding, are:
- Omicron Pi Omicron (1903)
- Sigma Delta (1904)
- Zeta Nu (1956)
National fraternities, with the date of their origination at Clarkson, include:
- Delta Upsilon (1922)
- Alpha Chi Rho (1956)
- Tau Kappa Epsilon (1963)
- Tau Epsilon Phi (1966)
- Delta Sigma Phi (1967)
- Phi Kappa Sigma (1981)
- Sigma Chi (1987)
- Sigma Phi Epsilon (2000)
The four national sororities at Clarkson are:
- Phi Sigma Sigma (1979)
- Delta Zeta (1986)
- Theta Phi Alpha (2006)
- Kappa Delta Chi Sorority, Inc. (2011)

Students are eligible to join fraternities and sororities according to the guidelines established by the Recognition Policy for Fraternities and Sororities. Recruitment activities typically take place during the first two weeks of each semester; however, chapters may elect to hold recruitment activities throughout the year.

Clarkson University’s Recognition Policy for Fraternities and Sororities holds that the futures of these organizations are determined by their demonstrated ability to contribute positively to high academic standards, good social behavior, and constructive extracurricular activities. Hazing and discrimination are prohibited.

Many fraternities and sororities maintain chapter houses and serve meals. Initiatives are underway to integrate fraternities and sororities more completely into the educational and social fabric of the University through the ongoing development of on-campus housing options. Currently, there are 4 fraternities with house on the campus. Housing exemption requests to live at chapter houses are considered by the Office of Student Organizations in conjunction with Residence Life and are made according to housing policies. Costs of joining social fraternities and sororities vary. Questions may be directed to the Director of Student Organizations and Student Center at 315-268-2345.

Honor Societies
Upper-class students who demonstrate high scholastic achievement in a given field and possess exemplary qualities of character and leadership are eligible for membership in a number of national and local honor societies. National honor societies include Beta Gamma Sigma (business administration), Chi Epsilon (civil engineering), Eta Kappa Nu (electrical and computer
engineering), Gamma Sigma Epsilon (chemistry), Omega Chi Epsilon (chemical engineering), Phi Kappa Phi (academic excellence), Phi Theta Kappa (transfer students), Pi Mu Epsilon (mathematics), Pi Tau Sigma (mechanical engineering), and Tau Beta Pi (engineering). Sigma Gamma Tau (Mechanical Engineering), Sigma Pi Sigma (physics), Psi Chi (psychology), Sigma Tau Iota is a local honor society available to Engineering and Management students, Tri-Beta (biology), Sigma Nu Tau Entrepreneurship Honor Society.

**Interfraternity Council**
The Interfraternity Council (IFC) is a body of representatives from each of the member chapters. From this body, the IFC Executive Officers are elected on an annual basis. In addition to the president, there are vice presidents who serve in various capacities, such as risk management, membership recruitment, educational programming, public relations, community involvement, etc. These students work with their Pan-Hellenic counterparts to offer programming for the Greek system and campus.

**International Student Organization (ISO)**
The ISO is an organization for both U.S. and International students. Students meet on a regular basis to celebrate holidays, take trips, socialize, and learn more about each other’s cultures. For more information, contact the International Student Advisor by mail at Clarkson University, Box 5645, Potsdam, NY 13699-5645, USA. Visit the ISO Web site.

**Journalism, Radio, TV**
Students interested in journalism can work on one of the University publications. The student newspaper, The Integrator, is published weekly. The Clarksonian is the University yearbook. Each is edited and managed by students.

A radio station is operated out of the Student Center. WTSC-FM operates as a broadcast station and is governed and operated by Clarkson students, as is the amateur (ham) radio club, K2CC. Clarkson students also operate the cable television station WCKN-TV. This station provides news shows and hockey coverage, as well as syndicated broadcasting.

**Music and Dramatics**
Those interested in music may participate in the Pep Band or orchestra. The Pep Band plays at sports events and the orchestra at various University functions such as Recognition Day. Students with an interest in acting may join Clarkson Theatre, which presents two or three productions a year. Past performances include “Harvey,” “Joseph and the Amazing Technicolor Dreamcoat,” “Arsenic and Old Lace,” “Once Upon a Mattress,” “Our Town,” and “Dracula.”

A wide range of concerts, plays, lectures and other cultural events are available through the Office of Student Life and Engagement, Clarkson Union Board, Residence Life, and student organizations. Events are also sponsored by the Associated Colleges of the St. Lawrence Valley. Movies, both foreign and domestic, are presented throughout each term at Clarkson and other nearby colleges.
Pan-Hellenic Council
The Pan-Hellenic Council (Panhel) is composed of delegates from each of the member sorority chapters. The council positions are divided among the delegates. The President and Vice President for Recruitment rotate between chapters; other positions are determined by appointment. Recruitment activities are typically conducted during the first two weeks of each semester, however individual chapter also hold recruitment events throughout the year.

Professional Societies
Numerous national professional societies maintain student chapters at Clarkson. These include Alpha Kappa Psi (national professional business fraternity-coed); American Indian Science and Engineering Society; American Institute of Astronautics and Aeronautics; American Institute of Chemical Engineers; American Product and Inventory Control Society; American Society of Civil Engineers; American Society of Mechanical Engineers; Arnold Air Society; Association of General Contractors; Association for Computing Machinery; Association for Women in Mathematics; Engineering and Management Society; Institute of Electrical and Electronics Engineers; National Society of Black Engineers; New York Water Environment Association (NYWEA); Society of Hispanic Professional Engineers; Society for Industrial and Applied Mathematics; and Society of Women Engineers; Society of Human Resource Management; American Chemical Society; American Academy of Physician Assistants.

Recognition Societies
One of the highest honors a Clarkson student can receive is to be tapped for membership in Phalanx, the senior leadership society. Students are recognized for their exceptional leadership ability, scholastic attainment, and extracurricular involvement.

The Arnold Air Society is a professional honorary service organization within the Corps of Air Force ROTC Cadets. Arnold Air provides a stimulating, service-oriented program that gives selected cadets enhanced leadership skill development opportunities while they provide service to the campus and the community.

Religious and Spiritual Life
Although it is not a church-affiliated university, Clarkson is interested in the moral and spiritual development of its students. Some students pursue their spiritual development in personalized ways, while others attend services of organized religious groups. Potsdam churches include Baptist, Christian Science, Church of Jesus Christ of Latter Day Saints, Episcopal, Jehovah’s Witnesses, New Hope Community Church (unaffiliated), Methodist, Nazarene, Presbyterian, and Roman Catholic. Potsdam’s synagogue is the Congregation Beth-El. There is also a mosque in Potsdam. There are Seventh Day Adventist and Unitarian Universalist churches in nearby Canton, a Congregational church in Norwood, and a Lutheran church in Massena.

The Inter-Varsity Christian Fellowship (IVCF) is a nondenominational organization of Christian students who host Bible studies, weekly fellowship meetings, and other activities. There are occasional meditation, yoga, and Buddhist groups that are open to students. For more information please see: http://clarkson.edu/campus_life/clubs/student_life/spiritualresources.html
Special Interest Clubs
Find a current listing of student organizations at: [http://knightlife.clarkson.edu](http://knightlife.clarkson.edu)

Knight Bus:
Transportation is a hurdle for our rural location. Low cost buses (Break Bus) for Clarkson University students that will take students to Albany and New York City.

Student Center
The Student Center is the focal point of activities on the Hill campus. If you see your Residence Hall as a bedroom, then we hope you will see the Student Center as your living room. The Student Center is a place where students can come to spend time between classes, study, and hold meetings and late night events. There are a variety of lounges and spaces with comfortable chairs and tables for studying and relaxing. In addition, meeting rooms are available for group meetings and other activities. Also available to students is the Forum, an innovate auditorium in the form of a stairwell equipped with a massive video wall (you have to see it to believe it). The space is often used for large events such as lectures, showcases, comedians, pre-released movie showings, and dances.

Besides being a great place to connect with your classmates, the Student Center is the home of many departments and services on campus. On the lowest level you can access the Mail Room and your student mailbox. You can also head over to the POD Store to pick up convenience items, listen to and watch the campus radio and TV station or write an article for the school newspaper (all of which have offices on this level). Our virtual game room is also on this level where you can play all of the newest video game hits.

On the ground level of the Student Center you will be able to visit the Student Center Info Desk, the Clarkson University Student Association (CUSA) and Student Organizations office, JAVA City, Bar 9, and even get money through our North Country Savings Bank ATM. On this level you will find the traditional game room with Pool, Darts, Foosball, Bubble Hockey and Ping Pong games all free for student usage.

The top floor of the Student Center houses our largest dining facility on campus as well as our Multipurpose Rooms (MPRs).

Cheel Arena
Cheel Campus Center boasts a 3,000 seat multipurpose arena. The Arena, home of men’s and women’s Golden Knights Hockey, is also the place to attend University Convocation, University Recognition Day, Commencement, and other large-scale events.

HEALTH & COUNSELING CENTER
Counseling Services
Counseling Services play an active role in helping Clarkson students adjust to college life and set immediate and long-range goals. The years spent in college are years of personal growth, changing relationships, exploration of values and feelings, and of learning how to be an independent adult. Development in these areas is as crucial to education as what is learned in
classrooms and laboratories. Throughout the year counselors provide workshops that teach skills and provide insights important to this development process. They also teach sections of the First-Year Seminar that is required of all first-year students. The counselors approach students with a sense of caring and a sincere desire to help them find personal fulfillment and satisfaction in their University careers.

Personal counseling is also provided by full-time professional counselors who are prepared to deal with a variety of concerns including stress, alcohol abuse, eating disorders, depression and sexual issues. However, students not only seek help for specific problems, but make use of counseling to explore feelings, values and life directions. Counselors also offer a variety of personality and vocational interest tests that can help increase self-awareness and clarify goals. In addition to counseling, the staff is prepared to make appropriate medical referrals.

Office of Accessability Services
This is the initial point of contact for students with documented disabilities seeking accommodations or services. The office is responsible for maintaining disability-related documentation, certifying eligibility for receipt of services, determining reasonable accommodations, and ensuring the provision of those services. Students are asked to make contact with the Office of AccessABILITY Services prior to the beginning of each semester at Clarkson, in order to ensure that accommodations will be available in a timely fashion.

The student will meet with the Director or Assistant Director of the Office of AccessABILITY Services to review documentation and determine appropriate accommodations.

The Office of AccessABILITY Services will assist the student with faculty and staff notifications requesting appropriate accommodations. Appropriate accommodations will be provided to students who have followed the procedures as developed by the Office of AccessABILITY Services. Services may include short-term arrangements for students who have become temporarily disabled.

Alcohol and Drug Education
Clarkson’s alcohol and drug educational efforts are focused on two important messages. The first emphasizes the legal obligations of students with regard to the use of alcohol or any other substance. The University’s alcohol and drug policies are stated clearly in the Clarkson Regulations and are guided by law. A civil community is built on respect for others and respect for the law. A second major emphasis is the complicated concept of responsible and moderate use of alcohol. The use of alcohol is interwoven in many everyday settings and activities in our culture. Education and policy at Clarkson are designed to insist on legal and moderate usage among those choosing to drink, and to discourage dangerous or harmful practices involving alcohol or other substances.

Campus programming is designed to convey the messages highlighted above. Students who are interested in participating in prevention efforts can contact the counseling staff on the ground floor of the ERC. Students with special concerns or problems with alcohol or drug abuse should
also contact Counseling Services at the same location.

**Health Services**
The University has forged a partnership with Canton-Potsdam Hospital, CPH, in which CPH provides professional staffing and services at the University’s Student Health Center. Through this partnership, students enjoy a comprehensive health care program and the broad professional capacities provided by the hospital and its highly trained staff. At the Student Health Center (centrally located in the Educational Resources Center) CPH provides clinical services to include basic medical care, preventative care, general physicals for student-related activities and limited urgent care. Students also have access to CPH’s state-of-the-art lab services. Most visits to Health Services and many of its services are free of charge. Health Services is open weekdays from 8 a.m. – 4:30 p.m. during the academic year. After hours’ emergencies are handled at CPH itself which is located approximately one mile from campus. There is also an Urgent Care Center on Lawrence Avenue in Potsdam.

CPH provides comprehensive acute medical-surgical care and emergency care, and has widely recognized programs in chemical dependency treatment, cardiac care, obstetrics, and physical rehabilitation services. The Hospital operates the Warner Cancer Treatment Center. In addition, CPH is an affiliate of renowned Fletcher Allen Health Care, headquartered in Burlington, VT.

**CAREER CENTER**
The Career Center assists all Clarkson students in career preparation, with a particular focus on external experiential learning opportunities to include cooperative education, internships, and international study programs. Assistance with pursuing post-college employment and graduate study is central to the mission of the Center. It is also a primary focus of the Center to develop relationships with business and industry that recruit or could potentially recruit our graduates, assuring that these organizations include Clarkson among their primary college relations and recruiting universities.

**Career and Job Search Services**
Individual career coaching appointments are available through the Career Center to discuss concerns such as career direction and choice, skills identification, employment opportunities, and job search techniques. Staff members are available to help students discern solutions and develop strategies to address career-related concerns.

The Center facilitates a wide number of career-oriented workshops for first-year students through graduate-level students, including career exploration groups, resume preparation, interviewing techniques, and job-search techniques. The mock interview program is noted for its success in preparing students for their job interviews. The bi-annual Career Fairs attract hundreds of employers to recruit on campus each year. Among the many benefits of a Clarkson education is the alumni network. Alumni serve as a critical link to the Center. The Center also reaches out to the community by planning programs with any campus organization or academic program.
The Career Center provides access to internship, co-op, and permanent job opportunities through the following means: an on-campus recruiting program with business, industry and government; Career Fairs; a Web-based resume database system that enables the Center to provide students’ resumes to employers; a job-listing and networking service on the Internet called CareerShift; and a network of thousands of Clarkson alumni who can be tapped at any time in the students’ years at the University.

Clarkson’s reputation with hundreds of companies across the country, combined with a comprehensive Career Center, has resulted in positive outcomes for the graduates consistently over the years. Specific employment statistics for recent classes are available upon request from the Center.

**Experiential Education Program: Cooperative Education & Internships**

**Cooperative Education (Co-op) Program**

The Career Center works closely with representatives of business, industry and government to place students in meaningful real-life work environments during the academic year. A Co-op experience provides students the opportunity to apply their academic knowledge and gain valuable experience while positioning them to obtain full-time professional employment upon graduation.

Typically, students participate in the Co-op Program for an academic semester and a summer. Students may choose to co-op from January through August or from May through December. However, the co-op work block timeframe is very flexible and the University makes every effort to match a student’s academic plans with a company’s work schedule. To help prepare students for the co-op experience, the Career Center provides skill-based seminars and workshops. The focus of these programs are on writing resumes, cover letters, practicing job interviews, and teaching students how to conduct a successful job search. A key decision for the student is how to make up coursework missed while in the workplace. Students can choose to attend summer school, use AP credit they have earned, overload coursework during the semester or push back their planned graduation date. Co-op students work closely with their academic advisor, Student Administrative Services representative and the Career Center staff to plan out a successful co-op experience. While away during the semester(s), a co-op student is considered a full-time student.

All University students are encouraged to consider co-op as a way to enrich their Clarkson education. Co-op positions are located across the country, though most are concentrated in the northeast. While on co-op, students are assigned a direct supervisor, paid a professional salary and are evaluated during their job assignment. Students are also encouraged to communicate with the Career Center while on co-op so that staff may monitor their progress. For more information, visit the Clarkson University Cooperative Education Web site at [http://www.clarkson.edu/career/students/exp_ed/coop_requirements/index.html](http://www.clarkson.edu/career/students/exp_ed/coop_requirements/index.html) or call 315-268-6477.
Internship Program
As part of the external experiential learning component, the Career Center offers an internship program. Students from all academic majors can pursue internships during any summer of their undergraduate or graduate program, as well as some unique study/internship programs that are offered during the semesters. Similar to the co-op program, special workshops are designed to prepare students for their job search and are offered throughout the year, along with individual advising. Most internships are paid; in some cases, students receive a stipend and may receive academic credit, and some internships are for credit only.

Internships are available with business and industry across the country; with local, state, and federal government agencies; and with other agencies, non-profits, and educational institutions. Students work closely with the Center and their academic advisors to select an internship that best suits their needs. For more information, visit Clarkson’s Web site at: http://www.clarkson.edu/career/students/exp_ed/internship_requirements/index.html or call 315-268-6477.

INTERNATIONAL CENTER
The International Center is a centralized office that consists of three operations:
- Study & Work Abroad
- International Partner Relations
- International Student & Scholar Services

Mission: We are a hub of international partnerships, programs and activities that provide innovative opportunities around the world, which advance the University’s global reputation.

For more detailed information on the International Center’s programs and services, please go to the website: http://www.clarkson.edu/internationalcenter

Study Abroad Program
Study Abroad provides an excellent opportunity for students to enhance their academic background and prepare for the global marketplace through exposure to another educational system and culture. The primary program open to all students offered by the International Center is the Student Exchange Program. The program is designed for students to spend a semester or a year abroad usually during their junior year.
Students go through a competitive application process during the sophomore year to be considered for the program. Clarkson University has articulated exchange agreements with over 40 colleges and universities in over 20 countries.

### Exchange Partners by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>University</th>
<th>City</th>
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</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Griffith University, Monash University, Queensland University of Technology, RMIT University, University of Newcastle, University of Technology, Sydney</td>
<td>Gold Coast, Melbourne, Brisbane, Melbourne, Newcastle, Sydney</td>
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<tr>
<td>Austria</td>
<td>Upper Austria University of Applied Sciences</td>
<td>Steyr &amp; Wels</td>
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<tr>
<td>China</td>
<td>ESSCA School of Management, Tsinghua University School of Materials Science &amp; Engineering</td>
<td>Shanghai, Beijing</td>
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<td>Croatia</td>
<td>University of Rejika</td>
<td>Rejika</td>
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<tr>
<td>Denmark</td>
<td>Technical University of Denmark</td>
<td>Lyngby</td>
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<tr>
<td>England</td>
<td>University of Northumbria, University of Bradford, University of Brighton, University of Leicester</td>
<td>Newcastle, Bradford, Brighton, Leicester</td>
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<tr>
<td>France</td>
<td>BEM/KEDGE, Ecole de Management Strasbourg, ESSCA School of Management, Grenoble Ecole de Management, Universite Catholique de Lyon, Universite de Technologie de Troyes</td>
<td>Talence, Strasbourg, Angers, Grenoble, Lyon, Troyes</td>
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<td>Konstanz, Heidelberg, Potsdam</td>
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<tr>
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<td>City University of Hong Kong, Hong Kong Baptist University</td>
<td>Kowloon</td>
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<td>Country</td>
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<td>Taiwan</td>
<td>National Taiwan Ocean University</td>
<td>Keelung City</td>
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<tr>
<td>Uruguay</td>
<td>University of Montevideo*</td>
<td>Montevideo</td>
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</table>

*Fluency Required

In addition to the semester or year-long exchange opportunities, Clarkson offers students the option to participate in short-term summer programs or faculty led trips. The short term summer programs are 2-3 weeks in duration and are ideal for those students who do not wish to be gone for a full semester or year. Faculty led trips usually occur immediately following the spring semester.

The Clarkson School of Business has a requirement for students to study abroad and has created the Global Business Program that along with the Student Exchange opportunities offers
students more options to meet this requirement. For more information about the Global Business Program in the School of Business visit http://www.clarkson.edu/business/gbp/

**Financial Policies**

*Exchange Programs:* Students who participate in the Study Abroad/Exchange Program through Clarkson must attend one of our exchange partner universities in order to receive financial aid. During the exchange semester(s) students pay their tuition to Clarkson; there is no tuition paid to the exchange university. Room, board, and other fees are paid directly to the exchange university by the student. The financial assistance package is applied to the participant’s account as if that student were attending Clarkson University. Any credit balance may be requested through the Director of Financial Aid in SAS after tuition is applied and all required financial aid documentation (i.e. loan promissory notes, signed summary, etc.) are processed. This credit can be used toward the room, board, and other fees at the exchange partner university. It is an important step in the application process for the student to consult with the Director of Financial Aid in order to understand how their financial assistance package will be applied to the study abroad/exchange experience.

*Non-exchange Programs:* Should a student decide to attend a non-exchange university, he or she must take a leave of absence from Clarkson for the semester involved. The student should work with the International Center for approval of these non-exchange programs. No tuition is paid to Clarkson and financial assistance may not be utilized.

**Academic Policies**

*Exchange Programs:* All courses must be pre-approved through completion of Off-Campus Coursework Permission Forms prior to leaving campus. All credit is transferred back to Clarkson for those courses that students complete satisfactorily. Course credit will be transferred as transfer credit on a pass/fail system. It should be noted that credit hour and grading systems differ from country to country and school to school. Participants should request to have their grades sent to the International Center at Clarkson prior to leaving their exchange program. It may take several weeks after a student returns to receive these grades.

*Non-exchange Programs:* The student is responsible for assuring that the courses to be taken through the non-exchange program have been pre-approved by the faculty at Clarkson using the Off-Campus Coursework Permission Forms. The International Center will assist these students with any questions regarding passports, visas, and travel, but non-exchange students will not be included in the official study abroad rosters. Course credit will be transferred as transfer credit on a pass/fail system.

**International Student & Scholar Services**

This part of the International Center informs and educates the international population as well as the University community on immigration regulations that govern international students, scholars and the University. The ISSS also coordinates services and benefits available to the international population and facilitates international cultural events within the Clarkson community.
ATHLETICS
Recreation and Intramural Activities
All students are encouraged to participate in intramural and recreational activities. Clarkson’s location provides students with a wide array of outdoor sporting opportunities including individual and team challenges. Intramural contests include both regular leagues and weekend tournaments. Recreational activities included both outdoor and indoor activities.

The Intramural Athletic league program includes the following: Softball, Touch Football, Field Soccer, Broomball, 3 on 3 Basketball, Ice Hockey, 5 on 5 Basketball, Volleyball, Indoor Soccer.

Weekend tournaments are also offered in Dodge ball and Racquetball as well as “Fun Runs” both semesters.

The Club programs include the following:

Aikido Bowling Broomball
Cricket Cycling Figure Skating
Football Golf Hurling
Kendo Ice Hockey Lacrosse
Netball Racquetball Rowing (crew)
Rugby Skiing Soccer
Tennis Ultimate Frisbee Volleyball
Baseball

The Recreational programs include the following:

Canoeing Hiking Overnight Camping
Kayaking Mountain Biking Cross Country Skiing
Down Hill Skiing Rock Climbing Ice Climbing
White Water Rafting Aerobic Exercise Yoga
Strength & Toning Kick Boxing Swimming

In cooperation with the University medical staff, the Physical Education Department will assist those students who are physically disabled to design a program best suited for their capabilities.

Facilities
The Henry R. Hodge Sports and Recreation Complex is located adjacent to the residence halls and easily accessible to all students. Facilities include The Deneka Family Fitness Center, Alumni Gymnasium, Schuler Recreation Building (which houses the Stephenson Field House and the Fuller Pool), the Denny Brown Adirondack Lodge, and the Snell Athletic Fields.

Additional facilities include Walker Center, Hantz Turf Field, Bagdad Field, Scott Field, Neugold Field and the Cheel Campus Center and Arena.
**Varsity Sports**

The Clarkson Golden Knights compete in 20 intercollegiate varsity sports, at the NCAA Division I level in men's and women's hockey and with the other 18 at the NCAA Division III/USCSA level. Women's Division III varsity teams include: alpine and nordic skiing, basketball, cross country, lacrosse, softball, soccer, swimming and volleyball. The men's teams include: alpine and nordic skiing, baseball, basketball, cross country, golf, lacrosse, soccer, and swimming.

Along with earning a myriad of awards on the playing field, athletes in all our sports have been consistently honored with academic recognition such as CoSIDA Academic All-America, University Presidential Scholars, USCSA, Liberty League and ECAC Hockey All-Academic. We have also had some NCAA Post-Graduate Scholarship recipients.

Clarkson’s Men’s and Women’s Hockey teams are widely regarded as premier programs in Division I. The Golden Knight Women have advanced to the NCAA Tournament in four consecutive seasons, reaching the pinnacle of success in 2013-14 by claiming the University’s first-ever NCAA National Championship title in any sport. Clarkson went 30-5-5 overall in 2015-16 and reached the NCAA Frozen Four for the second time in three seasons.

The Clarkson Men have skated to 71 winning seasons, earned 10 ECAC Hockey regular season crowns, won the conference championship tournament five times and have participated in 20 NCAA Tournaments since 1920-21. The Knights challenged for a top spot in the conference this winter and finished with 20 wins.

Women’s Volleyball has won four straight NCAA New York Regional Championships and compiled 134 wins since the beginning of the 2012 season. The Knights have won the Liberty League Tournament five times in the past seven seasons, winning the conference post-season title in 2009, 2012, 2013, 2014 and 2015. The Golden Knights made their seventh NCAA Tournament appearance this past fall, advancing all the way to the national quarterfinal round to cap off another 30-win season.

Both the Clarkson Men's and Women's Soccer programs had competitive seasons in one of the top Division III leagues in the country and produced several Liberty League All-Stars.
Clarkson’s Alpine and Nordic Ski teams dominate in the USCSA. The Women’s Nordic skiers won the USCSA National title in 2016. The Alpine Men’s and Women’s team both enjoyed strong showings with the Men placing fourth at the nationals and women eighth. The Golden Knights Men’s and Women’s Swim teams enjoyed solid seasons in 2015-16 with several swimmers putting in strong showings at the UNYSCSA Championships.

The Golden Knights Men’s Basketball team is a program on the rise, recording four winning seasons over the past five years.

Capping off its best seasons since the late 1980s, the Clarkson Women’s Basketball team claimed the Liberty League regular-season and postseason tournament championships and advanced to the NCAA playoffs for the first time since 1989. The Knights posted a 22-6 record.

Clarkson Baseball has emerged as one of the most successful programs for the Knights in the 2000s. The team has reached the conference tournament 11 times in the Liberty League’s 14-year existence, making it to the championship round six times.

In its third year of existence, the Golden Knights’ softball team enjoyed a breakout season this spring with a 20-13 overall recording, including an 11-game winning streak. Clarkson Men’s Lacrosse has made four NCAA Tournament trips in its history and has reached the conference playoffs 10 times in 14 years. The Golden Knights' have had 26 different All-Americans, with four players repeating the honors.

CLARKSON ALUMNI ASSOCIATION
The Clarkson Alumni Association was organized on Founder’s Day, November 30, 1904, and has existed since that time to benefit both the University and its alumni. The administration of the Association is vested in the Clarkson Alumni Council in partnership with the Alumni Office. The mission of the Clarkson Alumni Association is to engage and empower alumni as partners in the Clarkson community, nurturing their pride in their alma mater and promoting the interests of Clarkson University and its alumni. Alumni are actively involved identifying and recruiting quality high school students, and assisting the Career Center in providing career opportunities for our graduates. Alumni are also involved in supporting fund-raising efforts, mentoring undergraduates, serving as speakers on campus, serving on advisory councils, and providing opportunities to undergraduates to learn the value of being engaged alum. There is an extensive regional Clarkson alumni chapter program for alumni once they leave the University. Regional volunteers in numerous cities throughout the United States host alumni activities. Clarkson alumni stay in contact with friends and the University through various social networks including CU Online, the community for staying connected!

INFORMATION TECHNOLOGY AND UNIVERSITY LIBRARIES
Office of Information Technology
Clarkson University is wholly committed to providing high-quality computer resources, services and support to meet the diverse needs of its students and faculty. The mission of the Office of Information Technology (OIT) is to provide access to teaching, learning, research, administrative and communication technologies through a commitment to excellence in customer support and technical leadership in fulfillment of the
institutional mission. This involves leveraging the University’s corporate partnerships to provide high-performance hardware and software, while employing a distributed user support structure. As a result, Clarkson students receive access to up-to-date technology, backed by direct assistance from easily accessible and highly skilled OIT support staff.

Access to OIT resources is provided by a high-speed, fiber-optic network “backbone” connecting University classrooms, laboratories, on-campus housing, and faculty offices. Students are able to access their files and resources from any computer on campus, with remote access available for most systems.

OIT operates several computer laboratories that provide high-performance PC and Linux-based workstations, servers, and software for mathematics, statistics, data analysis, graphics, engineering design, simulation/modeling, document preparation, multimedia development, and use at Clarkson: relational database management/design. The following is just a partial list of software titles in:

- MAPLE
- MATLAB
- ANSYS
- AutoCAD
- 3D Studio
- Adobe Photoshop
- Adobe Premier
- MS Office Suite Professional
- STAAD
- SAP
- SPSS
- Visual Studio
- Oracle
- MasterCam

Clarkson’s computer labs support research and classroom instruction. One lab is equipped for high-resolution 3D graphics for use in modeling physical processes, chemical reactions, and material design in virtual reality.

OIT supports Clarkson’s commitment to integrating technology into the classroom through its user services operation. User services supports both students and faculty by providing and maintaining software, equipment and facilities for the production, dissemination, and utilization of learning resource materials. In addition to traditional audio-visual equipment, large screen computer and video projection systems are strategically placed in lecture halls throughout the campus for large group and classroom instruction. Wireless access is available in group study areas and lecture halls across campus, as well as in some residence halls.

**Student Personal Computers**

Because information technology is such an integral part of today’s marketplace, it is strongly recommended that every Clarkson undergraduate student have an appropriate personal computer. Entering students who do not already possess a PC may purchase one through the University. High-speed network access is available for all students residing on campus. In addition, students can also access the network at any one of the numerous computer labs and clusters in academic buildings.

Student PCs are linked to a broad range of resources on campus and around the world, which greatly enhances the academic experience. Students not only use their PCs for word processing, e-mail and Internet research, but also for accessing course software and library resources. Clarkson faculty makes extensive use of the Web for dissemination of instructional material and interactions with students.
Computer Assistance
Current information and answers to computer related questions are available on the OIT Web page at www.clarkson.edu/oit. For undergraduate and graduate students, OIT professional staff and assistance are available to help with all aspects of computer and network use.

The University Libraries
The University Libraries supports Clarkson University’s mission by promoting academic excellence through the implementation of programs, policies, and strategies geared towards the innovative vision of libraries in the 21st century in support of teaching and research. To achieve excellence, we provide high-level information literacy instruction, reference, research assistance, and a robust menu of services to respond to all needs of our clientele.

The Harriet Call Burnap Memorial Library is the main library located on the hill campus in the Educational Resources Center (ERC). The Health Science Library is the University Libraries’ branch library and is located in the Center for Health Sciences (Clarkson Hall) on the downtown campus.

The University Libraries’ collections are comprised of more than 1,149,617 resources in various formats including journals, books, audio visual materials, government documents, technical reports, Clarkson University dissertations, and archival materials and artifacts. You may also use your Clarkson ID to directly borrow library materials from any of the other Associated Colleges: St. Lawrence University, SUNY Potsdam and SUNY Canton. Requests for library materials from other libraries around the world can be made using Interlibrary Loan.

UNDERGRADUATE ADMISSION
Undergraduate Admission
Brian T. Grant, Vice President for Enrollment and Student Advancement

Candidates for admission to Clarkson as first-year students are graduates, or soon-to-be graduates of a secondary school, preparatory school or equivalent educational process. In special instances, students are considered for earlier admission provided their academic records demonstrate a very high potential for academic success. In these select cases, students may be required to take an Ability to Benefit Test as prescribed by both state and federal education departments. In addition to superior scholastic achievement, consideration is given to personal qualities, participation in meaningful extracurricular or out-of-school activities, leadership and other information that may indicate the potential for successful completion of a college career.

The Committee on Admission places particular emphasis upon the following:

1. The secondary school record.
2. The results of the SAT Reasoning Test or American College Testing Program (ACT) exams.
3. The personal statement describing a special interest, experience or achievement that is important and meaningful to you.
4. The recommendation of the principal, headmaster, or school counselor.
5. Students for whom English is not their first language are required to submit TOEFL scores.
6. SAT subject tests are optional.
A personal interview and a visit to the campus are strongly recommended. The purposes of the interview are to increase the applicant’s knowledge about Clarkson, provide an opportunity for the applicant to ask questions, and to share information about relevant personal, extracurricular and coursework preparations and backgrounds. For more information, call 800-527-6577, e-mail admission@clarkson.edu, or write the Office of Undergraduate Admission, Clarkson University, Box 5605, Potsdam, NY 13699-5605. Candidates for admission to Clarkson as transfer students should review the transfer admission section below.

**Academic Preparation**

A thorough secondary school background in English, mathematics, and science is important in the academic preparation of a candidate for admission. Among the 16 units of secondary school work, the applicant’s record should include the following:

<table>
<thead>
<tr>
<th>Engineering, Science, &amp; Engineering &amp; Management Programs</th>
<th>Business and Liberal Arts</th>
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<tbody>
<tr>
<td>English</td>
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<tr>
<td>Mathematics</td>
<td>Mathematics</td>
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<td>Science, including:</td>
<td>Science</td>
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<td>Chemistry</td>
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<td>Physics</td>
<td>1 unit</td>
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High school mathematics preparation should emphasize the thorough mastery of fundamental definitions, concepts, principles and operations. The applicant must have sufficient preparation in algebra and trigonometry to begin the study of calculus. Courses in the sciences should stress basic principles and conceptual and quantitative understanding through classroom and laboratory work. Chemistry and physics are particularly important as background for Clarkson’s first-year science courses.

**First-Year Application Procedure**

Students can apply using either the Clarkson University Unconventional Application or the Common Application. Students may submit either application online or in paper format. The applications are available at www.clarkson.edu/apply. The Common Application and Supplement Information Forms are available at www.clarkson.edu/apply.

A first-year application fee of $50 is required for those who submit a paper application. This fee is nonrefundable and must accompany the application. The application fee is waived for students who submit an application online. Candidates are encouraged to submit their completed applications between October 1 and January 15 of their final year in secondary school. It is the student’s responsibility to make certain that appropriate secondary school transcripts, SAT or ACT test results, and recommendations are provided either with the application or promptly thereafter.

Applications submitted after January 15 are given full consideration in the order of their completion. Offers of admission continue only if space permits.

Students wishing to postpone admission for a year may do so. The procedure is to apply for admission in the senior year of secondary school and, when making the deposit reserving a place in the class, request a one-year extension. Most requests for deferred admission mention an intention to work or to travel before beginning college.
Early Decision Plan
Early Decision is an option for students who after careful consideration are certain that Clarkson is their number one college choice. The plan does not prohibit the student from making other applications, but it does commit the student to withdraw other applications if accepted at Clarkson. Early Decision candidates are strongly encouraged to visit the campus and meet with our students, faculty, and staff.

The Early Decision deadline is December 1 of the senior year. The high school record through grade eleven, with SAT or ACT scores, and recommendations should be received no later than December 15. If November SAT scores are sent directly to Clarkson, they will be included in the early decision review. Admission notification will occur by January 1. Students who complete the Free Application for Federal Student Aid (FAFSA) will also receive financial aid notification.

Personal Interview
An informal interview is very helpful to the student in formulating college plans and is strongly recommended. It provides an opportunity to ask questions and gain a direct impression of the opportunities Clarkson offers and to determine the student’s “fit” with the University. This interview should be held on the campus with an admission staff member if possible, since a personal visit to Potsdam is highly recommended, for students receiving selected scholarships the interview is required.

The Office of Admission is open on weekdays from 9 a.m. until 4 p.m. and on Saturdays by appointment only. Interviews on campus should be arranged by letter or phone at least one week prior to the intended visit. A personal interview conducted by a local alumnus/a in the student’s hometown area may also be arranged through the Admission Office. The telephone number, for use during normal business hours, is 800-527-6577 or 315-268-6480.

Notification
All applicants are promptly notified upon careful review of completed credentials. In the event that it is necessary to postpone action pending the receipt of final grades, or for other reasons, applicants will be notified. Notification of admission begins in January of the senior year if all materials have been received.

Deposit
A $300 deposit is required when the first-year candidate accepts the offer of admission; the class is filled as deposits are received. The deposit is payable any time prior to the Candidate’s Reply Date, as established by the National Association for College Admission Counseling. The reply date is May 1.

The deposit is not refundable if the student decides not to attend Clarkson, and it is not credited to the yearly University charges. The deposit is placed in a special account to provide payment for any outstanding charges for which the student is responsible at the time of graduation or upon withdrawal from the University. At this time, the unused portion is refunded.

TRANSFER ADMISSION
Clarkson prides itself on the success and strength of its Transfer Program and has put in place numerous transfer articulation agreements with two-year (2+2 programs) and liberal arts institutions (3+2 engineering programs) within the United States. For a current list of institutions with which Clarkson has articulation agreements, please visit admissions.
Unlike most institutions, Clarkson has established a separate office within Undergraduate Admission dedicated to the needs of transfer students. As a result of this commitment to transfer students, Clarkson and, the local community, welcome a large number of new transfer students each fall and spring to the campus. The quality and success of these students is constantly reflected in the praise from the faculty and those who graduate with honors.

**Application Process**

Transfer applicants are defined as those students who have graduated from secondary school and, after the first full-time experience as a matriculated student at another university or post-secondary institution, wish to continue their college education at Clarkson. Transfer applicants are admitted on a rolling basis (as their files become complete); however, the preferred deadline for completed applications is July 1 for fall admission and December 1 for spring admission. Applicants must complete the following steps:

- Submit a completed Transfer Common Application form to the Director, Office of Transfer Admission, Clarkson University, Box 5610, Potsdam, NY 13699 or electronically via our Web site www.clarkson.edu/apply.
- Arrange for official transcripts to be forwarded from each institution previously attended and/or currently attending. Course descriptions in English are required for international students, if necessary.
- Submit the Dean of Students Recommendation, found at www.clarkson.edu/apply. This can be completed by Dean or equivalent title.
- Arrange for high school transcripts and SAT or ACT scores if applying with fewer than 24 credits, to be sent to the Transfer Office.
- Arrange for TOEFL scores to be submitted if English is not their first language. A 550 (paper based), a 213 (computer based), or 80 (internet based) score is required for admittance. Acceptance of other English testing exams or requests for waivers should be made in writing to the Director of Admission at the address above.
- Submit two Letters of Recommendation, including one from an academic professor/instructor.
- A personal statement describing a special interest, experience or achievement that is important and meaningful to you.

In addition, applicants should be aware that:

- The $50 application fee is waived by applying online or by completing an on- or off-campus interview.
- An on- or off-campus interview is optional, but strongly recommended.

Once a student’s file is complete, it will be reviewed for admission. Students who accept the offer of admission must submit a $300 deposit. (Three hundred dollars of this deposit is placed in a special account to provide payment for any outstanding charges for which the student is responsible at the time of graduation or upon withdrawal from the University. At that time, the unused portion is refunded.) After acceptance to Clarkson, the appropriate academic department evaluates transcripts to determine the number of credits to be transferred. If needed, the faculty member may recommend courses to be taken in the final term or summer before transfer. The evaluator will also propose a tentative course schedule for the student’s first semester on campus. This evaluation is completed and mailed to the student within approximately two weeks of acceptance.
Financial Assistance for Transfers
Clarkson has financial assistance opportunities available for entering transfer students. Please check the Scholarships and Financial Assistance section of this catalog.

2+2 Transfer Student Policies
The 2+2 Transfer Program is based on articulation agreements with two-year colleges. These agreements typically specify a program of study at the two-year institution that will prepare students to enter Clarkson with junior status (54+ credits). These agreements cover students wishing to study engineering, business, science, or other disciplines.

Students who do not attend an institution with a formal 2+2 agreement are also encouraged to apply. The lack of an agreement does not mean that a student is ineligible for transfer or will not receive transfer credit for courses. Transfer coordinators interested in establishing a formal agreement should contact the Director, Office of Transfer Admission, Clarkson University, Box 5610, Potsdam, NY 13699

3+2 Engineering Transfer Program
The 3+2 transfer programs are established with many colleges and universities in the United States. Students who participate take the first three years of the prescribed program at a four-year liberal arts institution. Subsequently, they transfer with junior standing into one of Clarkson’s four-year engineering curricula. Upon satisfactory completion of two years of engineering courses, students receive degrees from both institutions. The 3+2 program provides students with an opportunity to obtain an exceptionally broad and firm academic foundation in the arts and sciences coupled with specialized training in an engineering discipline. For further information, please contact the Director, Office of Transfer Admission, Clarkson University, Box 5610, Potsdam, NY 13699 or visit http://www.clarkson.edu/.

INTERNATIONAL STUDENT ADMISSION
As an internationally recognized institution, Clarkson has both undergraduate and graduate students and faculty from more than 44 countries. This multicultural richness is evidenced on campus in our student organizations, successful multicultural events and the number of events/trips scheduled by the International Student Organization (ISO). International students can enter Clarkson as first-year students, transfer students, graduate students, or as part of a University exchange program. For the purpose of admission, an international student is defined as a student who is studying or wants to study in the U.S. on a nonimmigrant visa. This definition does not include permanent residents or refugees who should apply using the same procedures as domestic students.

International students are a critical component of the Clarkson Community and integral to the mission and vision of the University (see The Clarkson Education). Clarkson wants all students to graduate with a firm academic understanding of their chosen field, with excellent written and oral communication and presentation skills, and knowing how to work effectively in diverse multicultural teams.

To assist international students in attending Clarkson, the institution:
• provides merit-based international scholarships to qualified applicants;
• has an International Student Advisor on campus;
• supports several international student organizations; and
• has established a special office in Undergraduate Admission to support international students.
International Student Application Process
Clarkson University is a member of the Common Application. International students, both first-year and undergraduate transfer, need to begin the admission process very early. Completed applications are continuously accepted; however, the preferred deadlines for completed applications are as follows:

**First-Year Applicants:**
- January 15 (Fall Admission)
- October 15 (Spring Admission)

**Transfer Applicants:**
- July 1 (Fall Admission)
- December 1 (Spring Admission)

Applications received after the dates above will be reviewed as space permits. Those applications arriving too late to process will automatically be deferred and considered for the following semester.

International applicants are admitted on a rolling basis (as their files become complete). Priority is given to those who complete their file by the preferred deadlines listed above. International first-year applicants may complete the Common Application online or in paper form. Applicants will also be asked to submit a Supplement Information Form. To request a paper application, please contact the Office of Undergraduate Admission, Clarkson University, Box 5605, Potsdam, NY 13699, call 315-268-2125, or e-mail intladmission@clarkson.edu. The electronic Common Application and Supplement Form can be accessed at www.clarkson.edu/apply.

All international students are encouraged to contact the U.S. Educational Advising Center within their country to receive guidance regarding the application process. U.S. Educational Advising Centers can provide many services to support international students who are planning on studying in the U.S. To find the center nearest you, visit www.educationusa.state.gov.

International Student Admission Requirements
To complete your file and process your application, we require the following documents:

**Official Transcripts.** Transcripts should include an English translation, if necessary. They should be accompanied by a school profile for all secondary schools or catalog/course descriptions from the higher institutions the applicant has attended. Mid-year and final grades also should be sent as they become available. National exam scores should also be submitted, if available.

**TOEFL (Test of English as a Foreign Language)** scores submitted (if English is not your primary language). For further information on the TOEFL exam, please visit www.ets.org/toefl or e-mail toefl@ets.org. See the information regarding English requirements below.

**SAT Reasoning Test** for first-year candidates only. For more information about the SAT and how to register for it, contact the College Board at http://www.collegeboard.org/. (Students from mainland China are exempt from this requirement.)

**Certificate of Finance.** The Certificate of Finance is required to verify the student’s sources of financial support for his/her expenses during the one-to-four years at Clarkson. In addition to completing the form, financial documentation verifying the source of funding is required from a bank, employer, or sponsoring
organization. Once a student is accepted by the institution, the Certificate of Finance is processed, and the enrollment deposit is submitted, an I-20 will be issued. The I-20 will reflect any merit-based scholarship awarded to the student. The Certificate of Finance form is provided by the International Admission office.

Recommendations. A minimum of two recommendations should be submitted, preferably one from a math or science teacher for applicants wishing to pursue an engineering or science degree. The letters should discuss the student’s ability to succeed at the university level and present reasons to admit the student.

Personal Statement. Describe a special interest, experience or achievement that is important and meaningful to you.

Campus Visit/Interview (optional). International students are strongly encouraged to visit the campus. The International Admission Office (tel. 315-268-2125) can greatly assist in coordinating the visit to include pick-up from nearby airports, arranging for student hosts, faculty appointments, campus tours, admissions interview, meals, and hotel arrangements.

Application Fee: There is a required $50 application fee for International first-year applicants. The application fee is waived for students who apply online. Once a student’s admission application file is complete, it will be reviewed and a decision made.

At the time of admission, an International student is considered for a merit-based international scholarship. Such awards vary according to the strength of the student’s academic record and in 2016 ranged from $5,000 to $25,000 per year.

Students who accept the offer of admission must submit a $300 nonrefundable deposit to reserve a place in the entering class. (Note: The deposit is placed in a special account to provide payment for any outstanding charges for which the student is responsible at the time of graduation or upon withdrawal from the University. At that time, the unused portion is refunded.

Admission Criteria for International Students
Students are selected for admission based on the following:
• Academic performance in secondary school, college or university
• Class standing
• Recommendation(s)
• SAT and TOEFL (English proficiency) scores
• Participation in extracurricular events, community service, and sports
• Essay and interview (if completed)
Financial Aid/Scholarships for International Students

**International Scholarships:** All international students are considered for scholarships based on their academic record that includes: grade-point average, class standing, SAT and TOEFL scores and letter(s) of recommendation. No financial assistance application is required. International student awards are available up to $25,000 per year.

**Honors Scholarship:** Students who are accepted into the Clarkson Honors Program receive an additional merit award. The Honors Program is aimed at providing a special environment for top students. To be considered, students need to be in the top 10% of their class and have excellent standardized test scores. For more information, please see the Honors entries in this catalog (see Academic Program Options).

**Employment:** International students are allowed to work on campus for up to 20 hours per week. The jobs include office worker, lifeguard, food service, etc. The number of positions available varies from year to year.

**Loans:** There are private lenders who offer educational loans to international students. In most cases, eligible students may borrow up to the cost of attendance less any financial aid for a given year provided they have a U.S. citizen or permanent resident co-borrower. Clarkson does not recommend any particular lender and does not offer a preferred lender list. Students are free to borrow from the lender of their choice.

**English Requirements**
Admission to Clarkson University requires a minimum TOEFL of 550 (paper based), 213 (computer based), or 80 (internet based) for undergraduates. Students may submit on a case-by-case basis other proof of English proficiency. Request for waiver of the TOEFL exam should be sent to the Coordinator of International Students.

**I-20/Visa**
U.S. Citizenship and Immigration Services (USCIS): The USCIS is the branch of the U.S. government that regulates the status of all people visiting the United States who are not citizens, including immigrants, visitors, students, and permanent residents (“green card” holders). International students attending Clarkson will be classified as nonimmigrant, subject to a number of regulations. They should take the time to understand their situation and to fulfill legal obligations. The International Students & Scholars Office will assist with Visa/I-20 issues, and can be reached by telephone at 315-268-7970 or by mail at Clarkson University, Box 5651, Potsdam NY 13699, USA.

**Getting a Visa:** To obtain a visa, students should submit an application and supporting documents with their passport to the U.S. Consulate or Embassy that has jurisdiction for their place of residence. Students must also submit the required SEVIS fee to the U.S. Department of Homeland Security prior to applying for their visa. Visit http://www.fmjfee.com/ for more information.

The supporting documents usually consist of the acceptance letter sent to the student by Clarkson; an I-20 for an F-1 (student) visa; evidence of ability to pay for studies; and sometimes evidence that the student does not intend to become an immigrant to the U.S. Check specific requirements for your home country. When the Consul is satisfied with the application, the student’s passport will be returned with a visa stamped in it. This stamp allows the student to enter the U.S. only when possessing the I-20.
It is not necessary for Canadian students to obtain a visa at the Consulate. They simply present their I-20, passport and evidence of support at the border. Canadian students are required to pay the SEVIS fee prior to their arrival at the border crossing.

For a list of Consulates and Embassies, including addresses and phone numbers, visit usembassy.state.gov/. Further international information can be obtained at www.clarkson.edu/isso.

**Accelerated Admission Graduate School Policy**

This policy is intended to encourage early consideration and preparation for graduate work at Clarkson by highly qualified students. Such students would likely participate in undergraduate research experiences and would have identified a graduate advisor before baccalaureate graduation. These students may also be interested in accelerating their course of study to graduate within three years in order to begin their graduate work as soon as possible.

Any student who completes at least two years of residential study at the University and who has received a baccalaureate degree from Clarkson will automatically be accepted into any Clarkson graduate program for a master’s degree, at minimum, if he or she meets the conditions below at the time of entry to Graduate School. Eligible students must have:

- graduated in good standing from Clarkson within the previous year and have taken any necessary prerequisite courses for entrance to the graduate program in question;
- exhibited the quality of character expected of an entering graduate student of Clarkson University, as indicated by a letter from their academic advisor, department chair, or the dean of the school in which their baccalaureate degree resides;
- maintained a minimum grade-point average of 3.50 in their major; and
- achieved a School-defined minimum score on a designated national exam; the CUSB requires the GMAT or GRE exam and all others require the GRE.

No indent Applications for graduate admission from students receiving a Clarkson University baccalaureate degree who have not met all conditions specified above will still be considered, but admission will no longer be automatic. Please see the Graduate Catalog for The Graduate School application procedures.

**Nondegree Students**

An individual may enroll at Clarkson University for nondegree study on either a full-time or a part-time basis. Although such individuals are classified as nonmatriculating, they are provided an opportunity for academic study in areas of interest. This status may be used to obtain exposure in a particular area as a foundation for further academic work. Many persons with a degree use this status to gain exposure to another discipline without pursuing a degree. Students who are enrolled as nondegree students may not earn a degree from the University without gaining admission to a degree-granting program. Nondegree students may accumulate up to 15 hours of coursework credit while in this status and must matriculate into a Clarkson degree program to earn credit beyond this.

Persons interested in admission as a nondegree student should contact Student Administrative Services. Nondegree students must obtain approval for the courses they want to take from the director of First-Year Advising and University Studies. This approval is given on the basis of the student’s academic background and personal goals. Such students have no class standing and are not eligible to participate in any extracurricular activities involving intercollegiate competition.
Part-Time Matriculated Students
A person may pursue a baccalaureate degree as a part-time matriculated student. For further information, call Student Administrative Services at 315-268-6451.

Expenses
Tuition and other charges at Clarkson are set at the minimum permissible for financially responsible operation, and are considerably below actual costs. Gifts and grants received through the generosity of alumni, industry, foundations, and friends play an important part in reducing the difference.

University Charges
The summary of annual fixed University charges for the 2016-2017 academic year follows:

Fixed Charges: 2016-2017
Tuition
- Undergraduate full-time charge (12 to 19 credit hours) $45,132
- Undergraduate Credit Hour Rate (11 hours or less) $1,504
Undergraduate students registered for 12 to 19 credit hours (inclusive) are designated as full-time students and are charged at the full term rate. Students exceeding the full-time load of 19 credits will be charged at the credit-hour rate for each credit hour over 19.

Room (based on two person in freshman housing) $7,554
Meal Plans $6,706
Fees Per Year
- Undergraduate Students $1,000
- Clarkson School Students $1,550
Undergraduate Full-Time Direct Costs $60,690

Other expenses, such as travel, books, and spending money, vary. An estimated figure is approximately $3,694 for one academic year.

Undergraduate Student Activity Fee
The student government charges each student a fee in support of the student activity program. This nonrefundable fee is collected each semester.

Activity Fee
The student government charges each student a fee in support of the student activity program. This nonrefundable fee is collected each semester.

Facilities Usage Fee
The facilities usage fee is charged to each full-time residential program student. The funds are nonrefundable and are applied toward expenses incurred in the operation of the Student Health Center and the recreational facilities available to students.
Health Insurance
Health insurance is mandatory at Clarkson University. You will not be cleared for the term unless a Health Insurance Form is on file in Student Administrative Services. A new form must be submitted each academic year. All students must either have health insurance coverage under their own policy or be covered by their parents’ policy or enroll in Clarkson’s contracted insurance. The rate for 2016-2017 is $2,125 for coverage from 8/1/16 – 8/1/17.

Payment
Payment in full for all tuition, fees, residence and dining expenses must be made on or before the financial clearance deadline published at the beginning of each term in the pamphlet of Financial Information, which is sent to students with the first tuition invoice for the term. Check-in cannot be completed and the student cannot be admitted to class unless satisfactory payment is made. All accounts will be assessed a late fee charge of 1% of the unpaid balance at the end of each month. Enrollment indicates that the student agrees to pay all attorneys’ fees and other reasonable collection costs necessary for the collection of any amount not paid when due and will be added to the unpaid balance. It is the University’s policy to withhold transcripts and diplomas until the balance of the account is paid in full.

Refund Policy
If a student withdraws from the University, all refunds will be based on the last recorded day of attendance determined by and attested to by the Registrar. A student who withdraws within the first four weeks of the term period is eligible to receive a refund as follows:

Semester/Trimester Program Refund Policy
If the student withdraws before the first day of classes 100% refund
1-5 class days 90% refund
6-10 class days 75% refund
11-15 class days 50% refund
16-20 class days 25% refund
21 class days to end of semester 0% refund

Refunds will be applied to:
1. Tuition, Activity Fee, Facilities Usage Fee: All fees are included in the refund calculations. There will be no refund of the student health insurance premium if coverage is in force.
2. Meals: Refunded on the same schedule (consumption will not be considered in refund calculation).
3. Room: Refunded on same schedule.

Official Date of Withdrawal
The official date of withdrawal is established upon receipt of written notice of withdrawal from the student by Office of the Vice President for Enrollment and Student Advancement.

Advanced Placement/Advanced Credit
A majority of students receiving Advanced Placement credit at Clarkson have taken the Advanced Placement Examination of the College Board. The most common AP areas are listed below. Credit in most other subjects is awarded when a score of 4 or greater is received. Clarkson also grants credit based on International Baccalaureate Exams and CLEP Exams. Advanced placement credit based on tests or
examinations (includes AP, CLEP, IB, etc.) will be limited to a combined 30 credit hours. For further information, contact Student Administrative Services at 315-268-6576.

**Biology**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>No credit</td>
</tr>
<tr>
<td>4</td>
<td>BY100 Biology Elective with Lab</td>
</tr>
<tr>
<td>5</td>
<td>BY140/142 and BY160/162 Biology I and II with Labs</td>
</tr>
</tbody>
</table>

**Chemistry**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>No credit</td>
</tr>
<tr>
<td>4</td>
<td>CM131 General Chemistry I</td>
</tr>
<tr>
<td>5</td>
<td>CM131/132 General Chemistry I/II</td>
</tr>
</tbody>
</table>

**Computer Science**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>Computer Science A</td>
</tr>
<tr>
<td>4 or 5</td>
<td>Computer Science AB</td>
</tr>
<tr>
<td></td>
<td>No credit</td>
</tr>
<tr>
<td></td>
<td>1, 2, or 3</td>
</tr>
<tr>
<td></td>
<td>Intro. to Computer Science I</td>
</tr>
<tr>
<td></td>
<td>Computer Science I</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CS141/142 Intro. to</td>
</tr>
<tr>
<td></td>
<td>Computer Science I/II</td>
</tr>
</tbody>
</table>

The computer science department schedules an exam in C++ for new students during the first week of the fall semester each year. Students earning a satisfactory grade receive credit for CS141 Introduction to Computer Science I. The exam may also be taken in other pre-approved languages. Contact the Computer Science Department for more information.

**English**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>Language and Composition</td>
</tr>
<tr>
<td>4 or 5</td>
<td>Literature and Composition</td>
</tr>
<tr>
<td></td>
<td>No credit</td>
</tr>
<tr>
<td></td>
<td>1, 2, or 3</td>
</tr>
<tr>
<td></td>
<td>LIT101 Literature and Writing (c1)</td>
</tr>
</tbody>
</table>

**Mathematics**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>Calculus AB</td>
</tr>
<tr>
<td>4 or 5</td>
<td>Calculus BC</td>
</tr>
<tr>
<td></td>
<td>No credit</td>
</tr>
<tr>
<td></td>
<td>1, 2, or 3</td>
</tr>
<tr>
<td></td>
<td>MA131 Calculus I</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MA131 Calculus I</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MA131/132 Calculus I/II</td>
</tr>
</tbody>
</table>

The mathematics department schedules a calculus exam during the first week of the fall semester. Students receiving a satisfactory grade receive credit for MA131 Calculus I. To be eligible for AP credit for MA131,
Calculus I, first-year students must also perform at a satisfactory level on the Calculus Readiness Survey (which is taken in late May) or successfully complete the on-campus advanced placement exam given in the first week of the fall semester. For further information, see the department Web page at www.clarkson.edu/math.

**Physics**

<table>
<thead>
<tr>
<th>AP score</th>
<th>Course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, or 3</td>
<td>No credit</td>
</tr>
<tr>
<td>4</td>
<td>SC131 Intro to Physics I</td>
</tr>
<tr>
<td>5</td>
<td>SC131 Intro to Physics I</td>
</tr>
<tr>
<td></td>
<td>SC132 Intro to Physics II</td>
</tr>
</tbody>
</table>

Credit awarded for Physics B, non-calculus-based physics, will not substitute for PH131 and/or PH132 required by many Clarkson majors.

**Advanced Placement Credit Through College Course Transfer**

Students may enter Clarkson having already taken college courses while still in high school. Such courses will be considered for academic transfer credit if a grade of C or better was earned. Students should send an official transcript as well as a course description to Student Administrative Services as soon as available. The course(s) will be evaluated for transfer credit by the academic department responsible for the course curriculum.

**Credit by Examination**

It is possible in some cases for a new student to take a special advanced-standing exam provided by the respective department. A satisfactory grade enables a student to receive credit. The format and availability of such exams are at the discretion of the appropriate department chairperson. Students interested in Credit by Examination are encouraged to notify the appropriate department as early as possible so a mutually convenient time to take the exam can be arranged. Note: Students who plan to take either or both the Calculus and Computer Science exams scheduled during the first week of the fall semester need make no special arrangements. Those exams are scheduled into orientation.

Clarkson will consider the following for advanced credit: AP, CLEP, GCE, A-levels IB, OACs, French Baccalauréate, Abitur, Italian Maturita and the Swiss Maturite. While credit is usually granted, there are situations, due to the technical nature of some of the programs, where it is not. Each case will be reviewed on an individual basis.

**Undergraduate Financial Assistance**

Financial assistance from Clarkson may consist of scholarships, grants, loans, and employment, either singly or in combination. The Office of Financial Aid distributes aid in such a way as to help the maximum number of qualified students enroll and continue in school until graduation. Students will not have the entire cost of education met by Clarkson; every student will be expected to pursue other sources of aid outside the University. Students are encouraged to explore state and private loan and scholarship opportunities through their high school guidance offices or state education departments.
Prospective U.S. first-year students who wish to be considered for aid from Clarkson must complete the following:

- File a completed application for admission by January 15th of the final year of secondary school
- File the Free Application for Federal Student Aid (FAFSA) no later than FEBRUARY 1st. The preferred and easiest method to apply is online at www.fafsa.ed.gov. The paper form may be available from high school guidance offices. Early Decision Plan applicants will receive appropriate applications and instructions directly from Clarkson’s Undergraduate Admission Office.

Prospective U.S. transfer students who wish to be considered for financial aid must apply for admission to Clarkson and submit the FAFSA form. Financial aid award notices are issued to transfer students on a rolling basis beginning in early March for fall admission and in early November for spring admission.

Retirement requirements for financial aid varies depending upon the source and type of aid - federal, state or institutional. Students must maintain Satisfactory Academic Program for Financial Aid. Some institutional, endowed and sponsored scholarships have a minimum GPA requirement. Most institutional scholarships are limited to 8 semesters. Responsibilities of students receiving financial assistance under provisions of one or more federal programs include an annual application (FAFSA) and maintenance of Satisfactory Academic Progress for Financial Aid as published annually in the Clarkson Regulations issued to each enrolled student. These regulations are available to prospective students upon request from the Admissions Office. Please note: Clarkson is required by federal regulations to verify specific information submitted on the FAFSA application. Federal compliance procedures require that parents and/or students submit IRS Income Tax Transcripts and W-2 forms if requested by Clarkson. The eligibility schedules for federal and New York State financial assistance can be found in the annual Clarkson Regulations.

**WHO RECEIVES CLARKSON AWARDS?**

At Clarkson almost 98 percent of all undergraduates receive some form of financial assistance which includes a variety of resources including grants, scholarships, loans and work study. Over 90 percent of first-year students receive awards directly from the University.

**SOURCES OF FINANCIAL ASSISTANCE**

**Clarkson Need Based Awards**

**Clarkson Grant**

Substantial funds are available for students who show above-average promise for success at Clarkson.

Award amounts vary according to the financial need and academic achievement. Awards for the academic year are made during the preceding spring by the Office of Financial Aid. Students must file the FAFSA each year to be considered for Clarkson Grants.

**Adirondack Scholars Award**

Competitive scholarships are available for students who reside in one of the following counties: Clinton, Essex, Franklin, Hamilton, Herkimer, Jefferson, Lewis, St. Lawrence, Warren, or Washington. This award is
based on merit and financial need. Students are required to file the FAFSA each year to be considered and/or continue to receive this award.

Clarkson Merit Based Awards -

Clarkson Merit Scholarship
A limited number of merit awards are available to both new and continuing students, based solely on prior academic success and the promise of future achievement. Consideration is automatic.

Clarkson Scholarship
A limited number of Clarkson Scholarships are available and are based on the overall admission application including high school GPA, Standardized Exam Scores, Extra-curricular activity, Recommendations, and Essays. Consideration is automatic.

Clarkson SAE Scholarships
Eight $6,000 scholarships are available to outstanding undergraduate students who plan to study engineering at Clarkson. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

Clarkson FIRST Scholarship
This award recognizes select high school seniors who have participated on a FIRST Robotics (FRC) or Tech Challenge (FTC) team. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

Five-Boroughs Scholarship
This award recognizes students from the five boroughs for their hard work and commitment to academics. Recipients will receive $6,000 per year upon enrollment at Clarkson. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

Project Lead The Way
This award goes to select high school seniors who have completed three Project Lead the Way courses in their high school. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

Spirit of Innovation
This scholarship recognizes select high school seniors who have been a Spirit of Innovation participant at their high school. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

SAGE Tuition Rewards (Savings and Growth for Education)
This is a unique, private college savings program. Tuition Rewards are discounts off tuition at participating colleges that represent the minimum scholarship that an eligible student will receive if attending a member college. A student receives Tuition Rewards from multiple "sponsors" (for example, parents and grandparents). A sponsor designates the tuition rewards to the student when she/he begins her/his senior
year of high school. If the student does not use the tuition rewards, they are rolled back into the sponsor’s account for use by other students.

Clarkson counts Tuition Rewards as part of the normal institutional and merit scholarships. For more information on SAGE Tuition Rewards please visit https://secure.tuitionrewards.com/index.cfm.

Clarkson WACE National CO-OP Scholarship Program
Up to $6000 per year scholarship based on academic record and scholarship application. Any major may apply. Submit the scholarship application online http://www.waceinc.org/scholarship/index.html. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by February 15.

Young Entrepreneurs and Young Innovators Programs
Prospective students who are selected into these programs at the Young Entrepreneurs and Innovators Business Plan Competition will receive guidance and support from faculty and alumni mentors, office space in our incubator, and will attend Clarkson without payment of tuition for their four year undergraduate career through a combination of merit-based financial aid (after accounting for other aid for which the student may be eligible) and a purchase by Clarkson of 10% equity in their firm at fair market value.

Clarkson Leadership and Achievement Award
This program annually recognizes high school juniors and community college students who demonstrate strong leadership qualities in combination with excellent academic achievement. Participating high schools and community colleges nominate one student each year for the Leadership Award. The student, upon acceptance and enrollment at Clarkson, will receive a $15,000-per-year scholarship for up to four years (total $60,000). These schools may also nominate one student each year for the Achievement Award who, upon acceptance and enrollment at Clarkson, will receive an $12,000-per-year scholarship for up to four years (total $48,000).

Tuition exchange recipients and students who receive the full tuition Clarkson employee benefit are not eligible to receive the Leadership or Achievement Awards.

Honors Program
Students of exceptional ability are accepted into the University Honors Program as entering freshmen or after their first year. All Honors students receive a scholarship as part of their Clarkson financial aid package. (See Academic Program Options).

Phi Theta Kappa Scholarship
For Transfer students only. Amounts vary.

Alpha Beta Gamma Scholarship
For Transfer Students only. Amounts vary.

Alumni Connection Awards
Holcroft Alumni Recognition Awards
Awards based on strong potential for success and the recommendation from a Clarkson alumnus/alumna. Awards are $500 per year—students can only receive one award, regardless of the number of recommendations. We suggest students contact alumni who know enough about them to provide a meaningful reference. Recommendation letters must be submitted by February 15 of the student's senior year (December 1 for Early Decision applicants).

**Alumni Family Award**
If you indicate on your application for admission that you have a brother, sister, aunt, uncle, or cousin who attended Clarkson, you may qualify for a $500 scholarship. Only one scholarship will be granted regardless of how many alumni family members you have.

**Alumni Legacy Award**
If you indicate on your application for admission that you have a mother, father, grandmother, or grandfather who attended Clarkson, you may qualify for a $1000 Alumni Legacy Scholarship. Only one scholarship will be granted regardless of how many qualifying family members you have.

**New York State Tuition Assistance Program (TAP)**
New York State residents may be eligible for TAP. NYS Legal Residency is required. For dependent students, parent NYS residency is also required. Awards range from $500 to $5,165 annually for up to 8 semesters. No repayment is required. Students must file a FAFSA application and an **Express TAP application (ETA)** each year to be considered for assistance. Awards are based on multiple factors including family size, number of siblings attending college in NYS and NYS taxable income. Students are notified directly by the **New York Higher Education Authority Corporation** (HESC) of their awards. TAP can only be credited toward tuition charges. For students who receive other tuition only scholarships or grants, the total of TAP and the other aid cannot exceed the tuition charge. TAP awards are credited to the student account after certification of full-time enrollment status and confirmation of satisfactory academic progress. The standards of satisfactory academic progress for TAP are indicated below.

Satisfactory Academic Progress - Effective July 1, 2011 New York State enacted revised regulations regarding satisfactory academic progress. The regulations changed the number of credits a student must accumulate and the cumulative grade point average that must be achieved each semester.

The chart that pertains to you depends upon the year you received your first TAP award and whether or not you are a HEOP student. Please refer to the charts below:

The following chart must be used by all institutions for students who received their first TAP in 2007-2008 through and including 2009-2010 and HEOP students who received their first award in 2007-2008 and thereafter:

<table>
<thead>
<tr>
<th>Calendar: Semester Program: Baccalaureate Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior being certified for this payment:</td>
</tr>
<tr>
<td>1st</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>A student must have accumulated this many credits:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>With at least this grade point average:</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
The following chart must be used by all 4 year institutions for students (excluding HEOP) who received their first TAP award in 2010-2011 and thereafter:

<table>
<thead>
<tr>
<th>Calendar: Semester Program: Baccalaureate Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Prior being certified for this payment:

<table>
<thead>
<tr>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
<th>9th**</th>
<th>10th**</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>15</td>
<td>27</td>
<td>39</td>
<td>51</td>
<td>66</td>
<td>81</td>
<td>96</td>
<td>111</td>
</tr>
</tbody>
</table>

A student must have accumulated this many credits:

| 0   | 1.5 | 1.8 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0   | 2.0   |

With at least this grade point average:

Other NYS Scholarships
New York State offers others scholarships in addition to TAP. Visit [www.hesc.ny.gov](http://www.hesc.ny.gov) for more information.

State Scholarships
New Jersey, Pennsylvania, Rhode Island, Vermont, and many other states have state-sponsored scholarship programs which can be used at Clarkson. It is suggested students contact their high school guidance office or state education department for information on state scholarships.

NYS Aid to Native Americans
A member of any Native American tribe within New York State may be awarded $2,000 annually for a maximum of four years of full-time study. State aid to Native Americans is an entitlement program. There is neither a qualifying examination nor a limited number of awards. Application forms may be obtained from the Native American Education Unit, New York State Education Department, Albany, New York 12234.

Pell Grants
Eligibility for the federal Pell Grant is determined by the Department of Education based on the information provided on the FAFSA. Students must submit a FAFSA each academic year. Award amounts are set annually by the federal government. Pell Grants do not need to be repaid.

Supplemental Educational Opportunity Grant (SEOG)
This is a nonrepayable federal grant, administered by the University and awarded to Pell Grant recipients. Students must submit a FAFSA each academic year. Awards are contingent based upon financial need and the availability of federal funding. Awards typically range from $300 - $600 annually.

Federal Work-Study Program
Federal Work-Study is awarded to eligible students based on the information submitted on the FAFSA. Students are given the opportunity to work at various sites on campus. The amount each work-study student may earn is predetermined by the Office of Financial Aid.

The student works a specific number of hours each week during the semester to earn that amount. Students are included in the University payroll system and receive a bi-weekly paycheck. Work-study
money is allocated to the University by the federal government and jobs are contingent upon funding.

**Veterans Scholarship Program**
The Veterans Readjustment Benefits Act of 1966 enables veterans to obtain financial aid for a college education. To be eligible, a veteran must have been released from the service since January 31, 1955, and have served more than 181 days. Information and applications are available at the local Veterans Administration Office.

Clarkson provides funds for highly competitive academic awards made annually to Army and Air Force veterans who have been separated from the service for less than a year. The scholarships provide up to full tuition until completion of the degree program.

**Air Force Reserve Officers’ Training Corps (ROTC) Scholarships**
Merit-based tuition scholarships are available to Air Force ROTC cadets ranging from $3,000 to full tuition and fees. Below is the list of current scholarships:

- TYPE I — $46,132 tuition and fees 2016-2017
- TYPE II — $18,000 towards tuition
- TYPE III — $9,000 towards tuition
- TYPE VI — $3,000 towards tuition
- TYPE VIII — A competitive-based academic upgrade of a TYPE II, pays up to 80% of tuition and fees.

TYPE I, II, III, and VIII include a book allowance of $300 per semester, a monthly tax free stipend of: Freshman - $300; Sophomore - $350; Junior - $450, and Senior - $500 and the Clarkson ROTC Incentive Scholarship (see below).

**Army Reserve Officers’ Training Corps (ROTC) Scholarships**
Army ROTC Scholarship winners receive the full tuition and fee benefit of $46,132 for the 2016-2017 academic year. Winners will also receive a book allowance of $1,200 per year and a tax-free stipend of $300-$500 per month for 10 months. All Army ROTC Scholarship winners are eligible to receive the Clarkson ROTC Incentive Scholarship.

**Clarkson ROTC Incentive Scholarship (Army and Air Force)**
Eligible ROTC Scholarship recipients may receive the Clarkson ROTC Incentive Scholarship. This scholarship is valued at $14,558 for the 2016-2017 academic year. Proceeds from the Clarkson ROTC Incentive Scholarship may only be used for housing and meal expenses.

**VA Yellow Ribbon Program**
Beginning in August 2009, Clarkson has been approved as a participant in the VA Yellow Ribbon Program. The Post 9/11 Veterans Educational Assistance Act provides partial tuition and fee benefits to eligible active duty, veterans and eligible dependents. As a Yellow Ribbon school, Clarkson will contribute 50% of the remaining cost of tuition and fees. The Department of Veterans Affairs will match this amount. In partnership with the Department of Veterans Affairs, Clarkson will ensure that the full cost of tuition and fees will be covered at a rate of 100%.
Employment at Clarkson
Each year various departments and offices on campus employ students who do not qualify for federal work study. Students may interview as the jobs become available. Student Administrative Services is able to assist interested students find employment at the University.

ARAMARK (University Food Service)
ARAMARK hires about 200 students each year. Students may inquire at the ARAMARK office when they arrive on campus.

Clarkson Payment Plan (PP)
Clarkson provides a 12-month payment plan, an option attractive to many families.

Participation in the PP is extended to anyone with a U.S. address. The applicant determines the amount to be financed; the maximum amount is the total charges less estimated financial aid, and the minimum amount is $1,000 a semester. The PP is available with no finance or interest charges, so long as payments are made in accordance with the terms of the contract.

Detailed information regarding the PP and applications are available from Student Administrative Services, Clarkson University, Box 5548, Potsdam, NY 13699-5548; 315-268-6451 or at http://www.clarkson.edu/sas/forms/index.html.

Clarkson Endowed, Sponsored, and Share Clarkson Scholarships
Various individuals, foundations and corporations have donated funds to establish scholarships for Clarkson students who meet certain criteria. Endowed scholarships provide assistance to students in perpetuity. Sponsored scholarships provide assistance on an annual basis. In general, these awards are made to incoming new students who show academic promise and leadership potential as well as continuing upper-class students who maintain exceptional cumulative grade point averages and meet other specified criteria. Recipients are selected by the Office of Financial Aid Scholarship Committee. Students are notified of the award by the financial aid package notification process (paper award letter for new students; on-line for continuing students) and amounts are credited to the student’s account each semester. Generally, students retain the award for the remainder of their undergraduate career at Clarkson to the extent of a four-year period, provided academic and financial aid satisfactory academic progress standards are maintained. Some scholarships have higher minimum GPA requirements.

Scholarships established through the generosity of Clarkson benefactors are awarded with the understanding that there is a moral obligation for the student to repay the funds received. By accepting the grant award, the student accepts the moral responsibility to contribute to Clarkson when financially able to do so. By fulfilling this moral obligation, the student will help replenish the grant fund ensuring Clarkson will be able to offer institutional aid to future students. A list of endowed and sponsored scholarships follows:

Endowed Scholarships
Advani Endowed Scholarship Fund
Ackermann
The Arthur, Dora and JoAnn L. Armani Endowed Scholarship Fund
Frank and Lee Augsbury Endowed Scholarship Fund
Azote Inc. Endowed Scholarship Fund
Gordon W. Babcock ’46 Endowed Scholarship Fund
Edward J. Baro ’77 Endowed Scholarship Fund
The Gordon C. "Stub" Baker ’27 Endowed Scholarship Fund
Raymond and Esther Baker Endowed Scholarship Fund
The Arnold and Helen Barben Endowed Scholarship Fund
The H. Douglas and Sara Barclay Endowed Scholarship Fund
Professor Robert Barr Endowment Scholarship
Charles E. Becker Memorial Scholarship Fund
John J. Bero, Sr. Memorial Scholarship Fund
Bart Blaner ’83 Endowed Scholarship
Andrea K. Bridge ’68 and John E. O’Beirne Endowed Presidential Scholarship Fund
Bradford Broughton Technical Communications Endowed Scholarship Fund
William G. Brown ’37 Memorial Endowed Scholarship Fund
Ernest and Evelyn Bulriss Endowed Scholarship
A. Douglas Burrow ’31 Endowed Scholarship
Purcell J. and Edith O. Brownell Endowed Scholarship Fund
Cala Family Endowed Scholarship Fund
Janice L. Campbell Endowed Scholarship Fund
Robert ’61 and Cynthia Campbell Hockey Endowment Scholarship Fund
Robert W. Carroll Jr. ’63 Graduate Endowed Scholarship Fund
Robert W. Carroll Jr. ’63 Undergraduate Endowed Scholarship Fund
James D. Cartin Memorial Scholarship Fund
Brian Y. Changlai MD, PhD ’70, Mary C. Daye MD ’71 and Brian A. Changlai MD Endowed Scholarship Fund
John D. and Helen Chapple Endowed Scholarship Fund
Siren R. Chudgar, MD ’96 and Jennifer L. Chudgar Endowed Scholarship Fund
Edwin C. Clark Memorial Scholarship Fund
Clarkson University General Scholarship Fund
Clarkson University Memorial Scholarship Fund
Clarkson University Parents Endowed Scholarship Fund
Class of 1947 Endowed Scholarship Fund
Class of 1963 Endowed Scholarship Fund
Frederick W. Cleveland North Country Merit Scholarship Fund
Thomas F. Clough ’62 Endowed Presidential Achievement Scholarship Fund
Doug and Jane Collette Endowed Scholarship Fund
Wallace H. Coulter Endowed Scholarship
Wendall O. Covell Scholarship Fund
Kristin Bandy Craig Memorial Scholarship Fund
The Crane Family Endowed Scholarship Fund
Clarkson University Pop Band Alumni Association Endowed Scholarship
Ralph S. Damon Endowed Scholarship Fund
David E. Davies ’77 Endowed Scholarship Fund
DeCrescenzo-Lupe Endowed Scholarship
Deneka Family Endowed Scholarship Fund
The Development Authority of the North Country (DANC) Endowed Scholarship Fund
R. David Diederich ’64 Memorial Endowed Scholarship Fund
Benson G. Diefendorf Endowed Scholarship Fund
James L. Dohr Accounting Scholarship Fund
Brendan Donohue ’84 Memorial Endowed Scholarship Fund
Richard C. ’55 and Joy M. Dorf Endowed Scholarship Fund
John M. ’59 and Joyce A. Eikenberg Endowed Scholarship Fund
Emerson Foundation Matching Grant for Endowed Presidential Scholarships
James E. Fassett Endowed Scholarship Fund
The Samuel B. Feitelberg Physical Therapy Fellowship Endowed Scholarship
Joan and Barry S. Fischer ’54 School of Business Endowed Scholarship Fund
Barry S. Fischer ’54 Endowed Scholarship Fund
Ferris Fayette Flint Electrical Scholarship Fund
John F. Frazier ’38 & L.K. Sillcox Endowed Scholarship
J. Ronald Frazer ’45 Endowed Fellowship
Walter Fuss ’51 Endowed Scholarship for Civil Engineering
Phil Garda ’67 Memorial Endowed Scholarship Fund
Alan W. Gibney ’69 Endowed Scholarship Fund
FLIR Systems, Inc. Endowed Scholarship Fund
Fred and Betsy Garry Endowed Scholarship Fund
William B. Gero Memorial Scholarship Fund
Alan W. Gibney ’69 Endowed Scholarship
Christopher W. Gilmore ’88 Memorial Endowed Scholarship
The Ruth and Sandy ’54 Ginsberg Endowed Scholarship Fund
Giromini Family Endowed Scholarship
The Joel ’57 and Lynda Goldschein Endowed Scholarship Fund
Frank C. Goodrich Memorial Endowed Scholarship Fund
George A. Gray Endowed Fellowship Fund
Karl A. Greenhagle ’69 Endowed Scholarship Fund
Anna and Frank Greenwall Scholarship Fund
Frank E. Gutmann Memorial Scholarship Fund
Margaret Van Hamlin Haddad Scholarship Fund
Steven W. ’68 and Laurie Hafener Endowed Scholarship Fund
David L. Hall ’65, ’68 Memorial Endowed Scholarship
Erwin C. ’48 and Jeanne Hamm Scholarship Fund
Hammam Endowed Scholarship
Terry O. Harden ’76 Memorial Scholarship Fund
Frank M. Hardiman Scholarship Fund
Harrison-Campbell Endowed Scholarship Fund
The Lynn P. Harrison, III and Tonya P. Harrison Endowed Scholarship Fund
William P. Harrison Endowed Scholarship Fund
Ralph E. ’55 and Solita Hawes Endowed Scholarship Fund
David ’83 and Sheryl Heacock Endowed Scholarship for Engineering and Management
Charles W. Hearl ’51 Endowed Scholarship Fund
William Randolph Hearst Endowed Scholarship Fund
Ellen Herrick Endowed Scholarship Fund
Barbara Hewett Lowers Endowed Scholarship
Mildred Dear Hill and Robert R. Hill ‘48 Endowed Scholarship
George O. and Clara E. Hodge Endowed Scholarship Fund
David L. ’75 and SaraAnne Baker Hopkins Endowed Scholarship
Harry and Florence P. Hull and Katherine Hull Endowed Scholarship Fund
William ’61 and Elaine Hurd Endowed Scholarship Fund
Michael Lewis Jaeger Memorial Endowed Scholarship
Clarke H. Joy ’29 Memorial Endowed Scholarship
Albert C. and Ella Hyde Endowed Scholarship Fund
Sol Kaplan Scholarship Fund
The Kardan Scholarship Fund
The Gary F. Kelly Endowed Scholarship Fund
Kent Family Endowed Scholarship
William H. ’53 and Beverly Lane Endowed Scholarship Fund
William H. Lane Incorporated Endowed Scholarship Fund
Earl L. LaPointe ’22 Memorial Scholarship Fund
Sylvain L. Larose ’75 Endowed Hockey Scholarship Fund
Kristine M. Layn Endowed Scholarship Fund
The Howard E. ’48 and Mary Lou Lechler Endowed Scholarship
Cecile and Herman Lieberman Endowed Scholarship Fund
Joseph ’82 and Rachel Loo Endowed Scholarship
Barbara Hewett Lowers Endowed Scholarship Fund
The Norman ’51 and Pat Maggione Scholarship
Jason Marsden ’91 Endowed Scholarship
Egon Matijevic’ Endowed Chemistry Scholarship Fund
Peter M. Mayo ’71 Endowed Scholarship
Theodore Sr. and Wanda McWharf Endowed Scholarship
Arthur, Eleanor and Jack Mietz Endowed Scholarship Fund
Charles T. Mosier ’72 Memorial Endowed Scholarship Fund
Steve Neely Endowed Memorial Scholarship Fund
J. Paul Nessler ’69 Memorial Endowed Scholarship Fund
The Ronald R. "Monk" Neugold ’52 Endowed Scholarship Fund
The Newell Family Endowed Scholarships:
   Edgar A. Newell Endowed Scholarship Fund
   Jean S. Newell Society of Women Engineers Endowed Scholarship Fund
   W. Allan Newell Endowed Scholarship Fund
New York State Federation of Home Bureaus (St. Lawrence County) Scholarship Fund
New York State Federation of Home Bureaus (Louise Villeneuve McMahon) Scholarship Fund
Lisa Niles ’78 Memorial Endowed Scholarship
Nathan and Janet Owen Endowed Scholarship Fund
Anthony J. Palumbo ’60, and Phyllis A. Palumbo Chemical Engineering Endowed Scholarship Fund
James P. Papayanakos Scholarship
Kenneth R. and Margaret K. Parker Endowed Scholarship Fund
Sara Snell Petersen/W. Hollis Petersen Endowed Scholarship Fund
The Dick Pratt Endowed Prize Fund (PEP Fund) established by Phyllis A. Palumbo and Anthony J. Palumbo, M.D. (1960), and Family
Ledyard H. Pfund ’40 Presidential Achievement Award Scholarship Fund
Leo ‘25 and Gertrude Ploof Endowed Scholarship Fund
Harold A. and Dorothy Putnam Endowed Scholarship Fund
Peter Radding ’63 Memorial Endowed Scholarship
George H. Randall ’16 and Paul W. Randall ’92 Endowed Scholarship Fund
Stephen C. Redding ’63 Memorial Scholarship Fund
Kyle G. Reichley ’85 Memorial Endowed Scholarship
Gerald ’58 and Judith Reinman Endowed Scholarship Fund
The Ernest ’42 and Constance Richmond Memorial Endowed Scholarship Fund
Ridings Family Endowed Scholarship Fund
Elwyn J. Rodee Endowed Scholarship Fund
Paul Rodgers Memorial Endowed Scholarship
William J. Rowley Endowed Scholarship Fund
Francis E. ’63 and Mona K. Sage Endowed Scholarship Fund
Albert L. and Mary S. Sayer Endowed Scholarship Fund
Joseph Scaturro Endowed Scholarship Fund
Fred Schoenhut ’78 Endowed Scholarship Fund for Hockey
Ralph and Jessie Scott Endowed Scholarship Fund
Willard G. Shafer ’53 Endowed Scholarship Fund
Shelly Electric Endowed Scholarship Fund
Thomas E. Simpkins ’30 Endowed Scholarship Fund
F. Carlton and Ethel B. Simpson Endowed Memorial Scholarship Fund
Sisson Family Endowed Scholarship Fund
Jay P. Smee ’52 Endowed Scholarship Fund
Barry P. Smith ’65 Endowed Scholarship Fund
James T. and Grace B. Smith Endowed Scholarship Fund
William D. ’54 and Shirley Smith Endowed Scholarship Fund
John Ben Snow Foundation Endowed Scholarship
George J. Stanley Endowed Scholarship Fund
Charles Thomas ’63 Adirondack Endowed Scholarship
The Thompson Family Endowed Scholarship Fund
Fay ’62 & Nadine Tolman Endowed Scholarship Fund
Toole-O'Donnell Families and MVW Endowed Scholarship Fund
Earle E. Towlson ’27 Memorial Endowed Scholarship Fund
Edward F. Tucker Endowed Scholarship Fund
Merton Van Sant/Industrial Development Agency Endowed Scholarship Fund
David A. Walsh ’67 Endowed Scholarship Fund
Melissa A. Walsh ’03, ’05 Memorial Endowed Scholarship
Mr. and Mrs. Robert N. Wagner Scholarship Fund
The Dr. John ’73 and Roberta Wasenko and Family School of Engineering Endowed Scholarship Fund
The Dr. John ’73 and Roberta Wasenko and Family Health Sciences Endowed Scholarship Fund
Dr. Mark W. and Beulah Welch Endowed Scholarship Fund
John “Jack” S. ’54 and Norma Welch Memorial Endowed Scholarship
Richard and Gina Weniger Memorial Endowed Scholarship
J.R. Weston Endowed Scholarship Fund
Nancy E. and James E. Wood ’64 Endowed Scholarship Fund
MK Woods ’82 Endowed Scholarship Fund
Clarence F. Wright Endowed Memorial Scholarship Fund
Eugene R. Yeager Jr. ’75 Memorial Scholarship Fund
Yentzer Endowed Scholarship Fund
Terry Yurkiewicz ’66 Memorial Hockey Endowed Scholarship
Zieger Endowed Scholarship Fund

Sponsored Scholarships

Barrett Paving CEM Sponsored Scholarship
Bechtel Foundation Sponsored Scholarship
Donald Clark Sponsored Scholarship
Clarkson Club Sponsored Scholarship
Clarkson University General Sponsored Scholarship
Colden Corporation Sponsored Scholarship
James A. Comstock Memorial Sponsored Scholarship
Bill Cotter ’73 Sponsored Scholarship
Kristin Bandy Craig Memorial Sponsored Scholarship
Crane Fund for Women and Children Sponsored Scholarship
DDS Companies Sponsored Scholarship
Delta Upsilon Sponsored Scholarship
Daniel P. Fellegara ’06 Memorial Sponsored Scholarship
Giromini Family Sponsored Scholarship
Glens Falls Contractors Association Sponsored Scholarship
NewPage Corporation Sponsored Scholarship
Edwin E. Hatch Foundation Sponsored Scholarship
Honors Program Sponsored Scholarship
Ralph A. Janaro Memorial Sponsored Scholarship
Michael Lewis Jaeger Memorial Sponsored Scholarship
Andrew Joseph Jankowiak Sponsored Scholarship
Kathleen Kafka and Reed Phillips Memorial Sponsored Scholarship
Key Bank Sponsored Scholarship
Krigman ’63 MME Undergraduate Research Grant Fund Sponsored Scholarship
Joel Lerich ’62 Memorial Sponsored Scholarship
Edward T. Misiaszek Sponsored Scholarship
Miss New York of the North Country Sponsored Scholarship
National Starch & Chemical Company Sponsored Scholarship
Steve Neely Memorial Sponsored Scholarship
North Country Friends Sponsored Scholarship
O’Brien & Gere Sponsored Scholarship
Karen Mazzella Olmstead ’84 Memorial Sponsored Scholarship
NI Rea Sponsored Scholarship
Gerald ’58 and Judith Reinman Sponsored Scholarship
Ruston Paving Company CEM Sponsored Scholarship
David Scaringe ’01 Memorial Sponsored Scholarship
Todd Stanley Searfoss ’79 Memorial Sponsored Scholarship
Sprout Foundation Sponsored Scholarship
Sprout Foundation Sponsored Scholarship #2
Stantec Consulting Services Incorporated Sponsored Scholarship
Norman Westerman Thurston '63 Sponsored Scholarship
Wildwood Foundation Sponsored Scholarship
Wyeth-Ayerst Sponsored Scholarship

**Share Clarkson Direct Scholarships**

Gilbert and Ruth Adams Class of 2017 Share Clarkson Direct Scholarship
Dorr B. Begnal '83 Class of 2015 Share Clarkson Direct Scholarship
Gordon Boncke '47 Class of 2016 Share Clarkson Direct Scholarship
Bruce G. Boncke '71 Class of 2019 Share Clarkson Direct Scholarship
Bouchard/Mountjoy Class of 2013 and 2018 Share Clarkson Direct Scholarship
Amy Castronova '04 Class of 2014 and 2019 Share Clarkson Direct Scholarship
James M. Coughlin '53 Share Clarkson Direct Scholarship
Sean '89 and Lori '89 Donohoe class of 2013 and 2018 Share Clarkson Direct Scholarship
Goldman Class of 2013 Share Clarkson Direct Scholarship
Joel '57 and Lynda Goldschein Class of 2014 and 2018 Share Clarkson Direct Scholarship
Elinore and Beecher '50 Greenman Classes of 2014, 2015, 2016, 2017 and 2018 Share Clarkson Direct Scholarship
Rosemary A. Harrington Class of 2015 Share Clarkson Direct Scholarship
W. Jon Harrington Class of 2015 Share Clarkson Direct Scholarship
M. Hubbard Construction, Inc. Classes of 2013 and 2016 Share Direct Clarkson Scholarship
Jolyn Foundation Class of 2013, 2014 and 2018 Share Clarkson Direct Scholarship
Matthew J. Maslyn '77 Class of 2015 Share Clarkson Direct Scholarship
John and Verna Sherrick Class of 2013 and 2018 Share Clarkson Direct Scholarship
Robert '74 and Julia Storms Class of 2015 and 2018 Share Clarkson Direct Scholarship
Structural Associates, Inc. Class of 2013 Share Clarkson Direct Scholarship
Alissa, Donna and Steven M. '68 Tritman Class of 2017 Share Clarkson Direct Scholarship
Susan J. and Ellsworth F. '65 Vines Class of 2015 Share Clarkson Direct Scholarship
Rita Fadale Wagner Class of 2013 Share Clarkson Direct Scholarship
In Honor of Katherine H. Wears Class of 2019 Share Clarkson Direct Scholarship
Wolfley Family Class of 2014 Share Clarkson Direct Scholarship

**Prize Funds**

Gregory P. Arnold ‘73 Memorial Award
Jerome D. Barnum Memorial Prize
Randy Brockway ’91 Memorial Award
Stephen Brunauer Memorial Award
Charles M. Clark Memorial Award
Frederica Clarkson Prize
Levinius Clarkson Prize
Vern Clute Memorial Academic Achievement
William Coleman Memorial Prize
Francis Deneen Prize
William Farrisee Memorial Award
Doc Jones Prize
Elizabeth A. Kissel ’90 Memorial Award
Richard Brady Legro ’82 Memorial Award
Albert Merrill ’13 Faculty Prize
Dr. Carl Michel Prize
Fran Neragin Prize
Perkins Family Memorial Award
Kyle G. Reichley ’85 Memorial Award for Excellence in Management
Shirley Rogers Memorial Award
Robert E. Rosati ’52 Award for Excellence in Mechanical Engineering
John B. Russell Memorial Prize
Ilse J. Shaw Award
R. Shankar Subramanian ’69 Prize for Outstanding Scholarly Achievement in Chemical Engineering
Martin A. Welt ’54 Family Awards

Endowed and Sponsored Prizes and Awards
Clarkson bestows prizes and awards, both monetary and nonmonetary, upon deserving Clarkson students in recognition of their outstanding contributions to the academic, athletic and extracurricular life of the institution. Amounts are credited to the student’s account.

A list of prizes and awards follows:
Raymond R. Andrews Achievement Award
Gregory P. Arnold ’73 Memorial Endowed Prize
The Cathy Avadikian and David Wells Award in Engineering and Management
Jerome D. Barnum Memorial Award
Randy Brockway ’91 Memorial Award
Stephen Brunauer Memorial Award for Excellence in Chemistry
CEE Junior Faculty Endowed Prize Fund
Charles Martin Clark Award
Clarkson Alumni Frederica Clarkson Award
Clarkson Alumni Levinus Clarkson Award
Vern Clute Memorial Academic Achievement Award
Communication & Media Sophomore Award
Communication & Media Junior Award
Communication & Media Senior Award
Major William Coleman Award
Francis DeLucia ’66 Endowed Prize Fund
Digital Arts & Sciences Sophomore Award
Digital Arts & Sciences Junior or Rising Senior Award
Francis Dineen Award
The Dean William J. Farrisee Memorial Award
John W. Graham Jr. Leadership Award
George A. Gray Endowed Fellowship
Doc Jones Prize Fund
Elizabeth A. Kissel ’90 Endowed Memorial Award
The John H. Koerner, Jr. ’76 Intramural Award
The John H. Koerner, Jr. ’76 Memorial Award
The Martin M. Koshar ’55 Endowed Prize
Richard Brady Legro ’82 Memorial Award
Albert D. Merrill ’13 Endowed Faculty Prize
Dr. Carl Michel Award
Mike Morrison ’89 Memorial Coaches Award
Fran Neragin Award
Perkins Family Memorial Award
Dick Pratt Endowed Prize Fund
The Norman L. Rea Award
Kyle G. Reichey ’85 Memorial Alumni Award for Excellence in Business Intelligence and Data Analytics
The Shirley Rogers Residence Hall Advisor Award
Robert E. Rosati ’52 Award for Excellence in Mechanical Engineering
Keith M. Russ Memorial Award
John B. Russell Memorial Prize
Ilse J. Shaw School of Management Freshman Award
Ilse J. Shaw School of Management Sophomore Award
Sigurds Arajs Memorial Award
STAFDA Outstanding Junior Award
STAFDA Outstanding Senior Award
Arthur L. Straub Memorial Award
R. Shankar Subramanian Prize for Outstanding Scholarly Achievement in Chemical Engineering
The Peter ’90 and Chandra Wargo Digital Arts & Sciences Award
Arthur J. Wells Prize
Martin A. Welt ’54 Family Awards

LOANS
William D. Ford Federal Direct Loan
Federal Direct Loans including both subsidized and unsubsidized loans, are low-interest loans funded by the federal government. Maximum annual borrowing limits are: First-year students, $5,500; sophomores, $6,500; juniors and seniors, $7,500. Aggregate loan totals for combined subsidized and unsubsidized loans cannot exceed $31,000 for dependent undergraduates and $57,500 for independent undergraduates. Aggregate loan limits for subsidized loans for all undergraduate students may not exceed $23,000.

Perkins Loan
The Perkins Loan is a federally funded, University-administered loan program for undergraduate students. This is a need based loan that is awarded based on information provided on the FAFSA. Loans are awarded annually based on the availability of funding. Loan amounts typically range from $1000 - $4,000.

The interest rate is five percent (fixed) and payments commence nine months after the recipient ceases to be a student. Under certain conditions, some or the entire loan may be subject to cancellation. Repayments are made on a monthly basis over a period not to exceed 10 years. The minimum monthly payment is $30. Students with Perkins loans who are withdrawing from Clarkson should contact ECSI, our loan servicer, to
arrange for an exit interview. ECSI may be reached at 888-549-3274 or online at www.ecsi.net. Click on the Borrower link and then log-in to your account.

**Clarkson Loan Funds**
Clarkson has 23 separate loan funds from which students may borrow up to $2,000 in any semester, subject to availability and borrower qualification. These loans are available through Student Administrative Services. Repayment begins nine months after a student’s enrollment at Clarkson terminates. A list of loan funds follows:

- Frederick E. Anderson Memorial Loan Fund
- The Arnold and Helen Barben Scholarship Incentive Loan Fund
- Beazer East Loan Fund
- Clarkson University Memorial Loan Fund
- ABB Combustion Engineering Scholarship Incentive Loan Fund
- Arthur Vining Davis Scholarship Incentive Loan Fund
- Decker/Dulude/Corning Scholars Program
- Demeree-Toohey Scholarship Incentive Loan Fund
- Charles A. Frueauff Scholarship Incentive Loan Fund
- Kent Family Endowed Scholarship Fund
- John H. Koerner, Jr., Loan Fund
- Robert and Jane LaHair Scholarship Incentive Loan Fund
- Lambda Phi Epsilon Student Loan Fund
- Theodore Sr. and Wanda McWharf Endowed Scholarship Fund
- George O. Miles Memorial Loan Fund
- National Grid Scholarship Incentive Loan Fund
- North Country Friends Loan Fund
- Alan D. Nolet ’78 Scholarship Incentive Loan Fund
- The William S. Prescott Memorial Incentive Loan Fund
- Procter & Gamble Chemical Engineering Loan Fund
- Elwood (Pete) Quesada Scholarship Incentive Loan Fund
- N. L. and Eleanor Rea Student Loan Fund
- George E. Snyder Memorial Loan Fund
- Walter E. Turnbull Memorial Scholarship Incentive Loan Fund
- Arthur O. and Louella K. West Memorial Loan Fund

Students with loans who are withdrawing from Clarkson should contact Student Administrative Services to arrange for an exit interview.

**TOTAL WITHDRAWAL FROM THE UNIVERSITY – TREATMENT of FEDERAL TITLE IV AND INSTITUTIONAL AID**
There are occasions when a student may leave the University prior to the completion of a semester. If a student officially withdraws from the University, takes a leave of absence, unofficially withdraws or is dismissed during the semester, for the purposes of financial aid each of these situations is treated as a withdrawal.

A student intending to leave the University must contact Student Administrative Services to begin the official withdrawal process.
The law specifies how Clarkson must determine the amount of Title IV program assistance that you earn if you withdraw from school. The Title IV programs that are covered by this law are: Federal Pell Grants, Iraq and Afghanistan Service Grants, Federal Direct Student Loans, PLUS loans, Federal Supplemental Educational Opportunity Grants (FSEOG) and Federal Perkins Loans.

When you withdraw from the University during the semester, the amount of Title IV program assistance that you have earned up to that point in time is determined by a specific formula. If you received less assistance than the amount that you earned, you may be able to receive those additional funds. If you received more assistance than you earned, the excess funds must be returned to the US Department of Education.

The amount of assistance that you have earned is determined on a pro rata basis. The formula is based upon the number of days the student has attended as a percentage of the total number of days in the semester. For example, if you completed 30% of the semester, you earn 30% of the assistance you were originally awarded. Once you have completed more than 60% of the semester, you have earned all of the assistance that you were awarded for the semester. Federal regulations require this calculation if the student officially or unofficially withdraws, is dismissed or otherwise leaves the University during a semester.

Student transcripts are reviewed at the conclusion of each semester. If a student received all “F” grades during a semester, federal regulations require the Office of Financial Aid to obtain additional information from the Academic Department(s). If the Academic Department(s) determines that the student completed yet failed to meet the course objectives in at least one course, no changes to the student’s financial aid for that semester is required. If, however, the Academic Department(s) determines that the student did not complete all courses (i.e. stopped attending all courses); the student is considered to have unofficially withdrawn from the University. In this case, the last date of an academic related activity (i.e. documented attendance in class, submission of a homework assignment or the taking of an exam) is used to determine the date of the unofficial withdrawal. If the last date of an academic related activity is after the 60% date of the semester, no adjustment to a student’s financial aid for that semester is required. If, however, the date occurs prior to the 60% date, a Title IV refund calculation is required and necessary adjustments to a student’s financial aid for the semester will be made. In absence of a documented last date of an academic related activity, federal regulations require Clarkson to use the midpoint (50%) of the semester.

The Federal Title IV Refund Procedure is separate and distinct from the Office of Student Account’s refund policy for tuition, fees and other charges at Clarkson. Therefore, a student may still owe funds to cover unpaid institutional charges.

Clarkson scholarships, grants and loans aid will be reduced based on individual circumstances, the date of withdrawal and the Student Account Refund Policy.

Satisfactory Academic Progress for students who return to the University for a subsequent semester will be reviewed and a determination will be made based on the Maximum Time Frame, PACE and GPA standards as stated above.
SCHOOL OF ARTS & SCIENCES

Peter R. Turner, Dean; Jerry W. Gravander, Associate Dean

The School of Arts & Sciences provides the foundation for all of Clarkson’s degree programs and also offers distinctive majors and minors.

The School of Arts & Sciences offers an array of major programs. Some are in traditional disciplinary areas such as Biology, Chemistry, Computer Science, Mathematics, History, and Psychology, while others, such as Biomolecular Science and Digital Arts & Sciences, integrate knowledge from several disciplinary areas to address recently emerging issues. All benefit from Clarkson’s strengths in engineering and business, and all are focused on preparing students for graduate school, professional programs, and careers.

All Clarkson undergraduates complete the Clarkson Common Experience, which includes courses in science, mathematics, technology, and the humanities and social sciences. These are critical components of every degree program in the University, and through them students acquire the quantitative reasoning, critical thinking, and effective communication skills and the basic scientific knowledge that are essential in their major programs and in their development as responsible citizens, effective professionals, and technological leaders.

Our rapidly changing and increasingly complex world makes it desirable for students to extend their education beyond the boundaries of their particular major. The School of Arts & Sciences provides students in all areas of the University the opportunity to do so through its numerous minor programs.

Pre-Professional Programs

Pre-Occupational Therapy
Clarkson offers an undergraduate Pre-OT advising program and a graduate degree program in Occupational Therapy. Students interested in preparing for entrance into Clarkson’s Masters of Occupational Therapy degree program should contact the department at 315-268-2161.

Pre-Physical Therapy and Physical Therapy
Clarkson offers an undergraduate Pre-PT concentration and an entry level Doctor of Physical Therapy graduate degree program. Students interested in preparing for entrance into Clarkson's Doctor of Physical Therapy degree program should contact the department at 315-268-3786.

Pre-Physician Assistant and Physician Assistant Studies
Clarkson offers an undergraduate Pre-Physician Assistant advising program and a graduate degree program in Physician Assistant Studies. Students interested in preparing for entrance into Clarkson’s Masters of Physician Assistant Studies degree program should contact the department at 315-268-7942.

Pre-Medicine, Pre-Dentistry, and Pre-Veterinary Programs
Students may earn a degree in any major program and also prepare for careers in health sciences. Students interested in preparing for professional schools in dentistry, medicine or veterinary science should contact the Chair of the Health Professions Advisory Committee at 315-268-3968.
Pre-Law
Pre-law advising is available for students in the School of Arts & Sciences to help them develop academic programs that will serve as a strong foundation for future legal studies. A list of pre-law advisors is available through the School of Business. The advisors provide counseling and information about law schools and careers in law.

Other Curricular Opportunities

Minors
Clarkson’s curricula contain a number of elective courses. Furthermore, many students have room for additional courses through advanced placement, overloading, and by taking courses in the summer. Therefore, students, in consultation with their advisors, have an opportunity to formulate academic programs that reflect individual interests, career goals, and areas of professional specialization via minors in all of Clarkson’s schools.

University Honors Program
Clarkson offers a four-year undergraduate University Honors Program for exceptionally talented students in any major. For more information, call the director at 315-268-2290.

Co-ops and Internships
Students interested in gaining work experience while in college are encouraged to participate in the University Co-op or Internship Program. Please refer to the Career Center for more details on these programs.

Study Abroad
Students interested in cultural and trade relations between the United States and other countries may participate in the University Study Abroad Program. Any sophomore may apply.

Bachelor of Professional Studies
An entering first-year or transfer student may create, in consultation with an academic advisor, a program uniquely tailored to meet special occupational or career objectives through the Bachelor of Professional Studies (BPS) degree.

4+1 Program
Students majoring in Arts and Sciences may use their free electives to provide a foundation for entering a 4+1 program at Clarkson. Through this program, students complete a Master of Science in Management Systems or a Master of Business Administration with one year of coursework beyond the bachelor degree. Contact the Graduate Business Programs Office at 315-268-6613 for more information.

Alternatively, students in the Sciences can use electives with some selective overloads to start senior year work towards an MS in one of the science disciplines, such as chemistry. Thus, within a five-year program, the student would receive both a BS and a thesis MS degree. This puts the student in a better competitive position for work or advanced graduate education.
Social Documentation: Communication and Humanities/Social Sciences Integrated Double Major

This innovative option invites students to combine their interests in learning and using cutting-edge technology with a solid base in the social sciences (history, political science, anthropology and sociology) or the humanities (literature, film and philosophy).

Social Documentation (SD) emphasizes creativity, flexibility and versatility, allowing students to pursue a broad span of interests leading to careers in filmmaking, writing, web-based technologies, radio and TV, or governmental and non-governmental agencies. Guided by their SD advisor, students choose courses in both their majors that reflect their own interests and future plans; additionally, they take a series of core courses in common with all other SD majors to gain the research, technical and rhetorical skills they will need for career success. (For further information, see the Social Documentation section under Interdisciplinary Undergraduate Programs.)

Science Studies

Many students approach their first year having found all of their secondary school science courses fascinating and wishing to explore several fields more deeply before declaring a major. These students may choose to participate in the Science Studies option which provides students with an opportunity to learn more about programs within the School of Arts & Sciences prior to selecting a final program for continued study. Students taking advantage of this option work with an advisor to develop an individualized course schedule for the first semester, designed to facilitate explorations and to keep options open. These individualized programs may involve trade-offs in later course selection, but will not extend time required to obtain a degree. With assistance from their academic advisor, undergraduates will select an approved program which best suits their individual goals and objectives. Science Studies students are fully matriculated students at Clarkson University. For more information, contact the Science Studies advisor at 315-268-6544.

Faculty

Biology
Tom A. Langen Chair and Professor of Biology; Professors Thomas Lufkin, Michael R. Twiss, Craig Woodworth; Associate Professors, Kenneth Wallace; Assistant Professors Andrew David, Cintia Hongay, Petra Marion Kraus, Stefanie Kring, Damien Samways, Shantanu Sur, Susan Bailey; Adjunct Professor Marcia Anne Blackman; Adjunct Assistant Professor Jr-Shiuan Lin, William Walter Reiley, Alexei V Tumanov; Instructors, Patricia Burdick, Michael Tighe

Chemistry and Biomolecular Science
Devon Shipp Chair and Professor of Chemistry and Biomolecular Science; Egon Matijević Chair in Chemistry Silvana Andreescu, CAMP Distinguished Professor Dan Goia, Milton Kerker Chair and Professor in Colloid Science Evgeny Katz, Senior University Professor Richard E Partch; Associate Professors, Phillip A. Christiansen, Costel Darie, Artem Melman, James C. Peploski; Assistant Professors He Dong, Paul Goulet, Galina Melman, Mario Wriedt; Adjunct Assistant Professor Kevin MacVittie; Research Assistant Professor Alisa Genevieve Woods; Distinguished Emeritus Professor Petr Zuman; Instructor and Instrument Manager, Daniel Andreescu
Communication and Media
Bill Karis Chair; Professors Stephen Farina, Johndan Johnson-Eilola; Associate Professors William Dennis Horn, Jason Schmitt; Assistant Professors Alex Lee, Steven Pedersen, Eric York; Instructor Courtney Johnson-Woods, Dan Dullea

Computer Science
Christopher Lynch Chair; Associate Professors Alexis Maciel, Jeanna Matthews, Christino Tamon; Assistant Professor Natasha Banerjee, Yaoqing Liu; Emeritus Professor James Lynch

Humanities and Social Sciences
Bill Vitek Chair; Professors, Joseph Duemer, Jonathan Goss, Sheila F. Weiss; Associate Professors Stephen Bird, Ellen C. Caldwell, Stephen Casper, Laura E. Ettinger, Michael Garcia, Sarah C. Melville, Christopher C. Robinson, Annegret Staiger; Assistant Professors Jennifer Ball, Michael Garcia, Brian Hauser, Claudia Hoffmann, Matt Manierre, Christopher Morris, S.N. Nyeck, Lisa Propst, JoAnn Rogers, Christina Xydias, Ryan Zroka; Professor Emeritus Owen E. Brady, Daniel Bradburd, David M. Craig, Lewis P. Hinchman, John N. Serio, Jan Wojcik

Mathematics
Joseph Skufca Chair; Professors Erik Bollt, Kathleen Fowler, Scott Fulton, Associate Professors Sumona Mondal, Adom Domonic Giffin; Assistant Professors Ying He, Rana Parshad, Guohui Song, Jie Sun, Guangming Yao, Michael Felland, Christopher Martin, Sara Morrison, Brad Smith, Diana White and Marko Budisic; Mathematics & Computer Science Visiting Assistant Professor Ahmad Rasheed Almmani

Physician Assistant Studies
Keith Young Chair; Assistant Professors Roberto Fadda; Clinical Assistant Professors Laura Goshko, Terri Evrard Joyce, Katharine Matthis, Tonya Seymour, Dawn White; Adjunct Clinical Assistant Professor Mariam Asar, Christopher Brandy, Sanjeev Gupta, Gregory Healey, Nedim Hukovic, Michael Joyce, Avery Marzulla-Dulfer, Laurie Mousaw, Orrin Palmer, Imre Rainey-Spence, Pakkam Rajasekaran, Charles Wilson; Adjunct Clinical Instructor Ryan Titus; Adjunct Clinical Professor Manasvi Jaitly;

Physics
Dipankar Roy Chair; Professors Vladimir Privman – Robert A. Plane Chair, Daviel ben-Avraham, Lawrence Schulman, Associate Professor Maria Gracheva; Assistant Professors Dmitriy Melnikov, Michael Ramsdell, Jan Scrimgeour, Joshua Thomas; Professor Emeritus M. Lawrence Glasser;

Psychology
Robert Dowman Chair; Associate Professor Andreas Wilke; Assistant Professors Olga Bogolyubova, Jennifer Knack, Lisa Legault; Adjunct Instructor Gary Kelly
**Undergraduate Arts & Sciences Majors**

**BS in Applied Mathematics & Statistics**
Joseph Skufca, Program Chair

Applied mathematics is a problem solving profession. Mathematical and statistical methods provide the tools for the analysis and solution of real-world problems which can be formulated quantitatively. While all technical fields require a solid foundation in mathematics, students of applied mathematics and statistics dig deeper, developing expertise both in mathematical methods and in the applications areas which interest them.

The BS in Applied Mathematics and Statistics is designed for students who wish to develop their mathematical skills and apply them to challenging problems. In addition to gaining a solid and broad education in applied mathematics and statistics, students also choose applications electives in areas of engineering, science, or business that give rise to significant applications of mathematics. The program is sufficiently flexible that students can also complete a minor or double major in another field, such as computer science, physics, or business. Students are encouraged to participate in research projects with faculty, starting as early as their freshman year. Graduates work in industry, business, research laboratories, or government agencies as applied mathematicians, statisticians, and actuaries. Some continue their education in graduate programs in applied mathematics, statistics, or applications areas.

The curriculum is designed so that students learn to:
- reason clearly, logically, and analytically;
- demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics;
- work effectively with standard mathematical software packages and write mathematical programs using a high-level computer language;
- apply mathematical knowledge to solve real-world, open-ended problems;
- read mathematical texts and literature and write mathematical proofs;
- communicate effectively, both orally and in writing; and
- work effectively both individually and in teams.

In addition to the major in Applied Mathematics and Statistics, the mathematics department also offers a separate major in Mathematics, with more emphasis on abstract mathematics and proof; this major may be more appropriate for students whose primary interest is in the mathematics itself if they are planning graduate study in mathematics or statistics.

In addition to the general undergraduate requirements, students majoring in Applied Mathematics and Statistics must complete the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students must complete 44 credits in the MA/STAT subject areas, including the following courses:</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>MA 131</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MA 132</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MA 200</td>
<td>Introduction to Mathematical Modeling &amp; Software</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>MA 211</td>
<td>Foundations</td>
<td>3</td>
</tr>
<tr>
<td>MA 231</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>MA 232</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MA 339</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MA 363</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MA 377</td>
<td>Numerical Methods</td>
<td>3</td>
</tr>
<tr>
<td>MA 499</td>
<td>Professional Experience</td>
<td>0</td>
</tr>
<tr>
<td>STAT 383</td>
<td>Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MA 451</td>
<td>Introduction to Mathematical Research</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Or MA 453 &amp; MA 431</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction to Mathematical Instruction, and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematics Course Assistance</td>
<td></td>
</tr>
<tr>
<td>Three of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA 331</td>
<td>Fourier Series &amp; Boundary Value Problems</td>
<td>3</td>
</tr>
<tr>
<td>MA 332</td>
<td>Intermediate Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>STAT 381</td>
<td>Probability</td>
<td>3</td>
</tr>
<tr>
<td>STAT 382</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 384</td>
<td>Advanced Applied Statistics</td>
<td>3</td>
</tr>
<tr>
<td>CS 141</td>
<td>Introduction to Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>PH 131</td>
<td>Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PH 132</td>
<td>Physics II</td>
<td>4</td>
</tr>
<tr>
<td>Science Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any 3 credit course from the BY, CM, or PH subject area</td>
<td>3</td>
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<tr>
<td>Application Electives – Five courses from the following list:</td>
<td>15-16</td>
<td></td>
</tr>
<tr>
<td>BY 314</td>
<td>Bioinformatics</td>
<td></td>
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<tr>
<td>CE 420</td>
<td>Computational Methods of Struc</td>
<td>3</td>
</tr>
<tr>
<td>CE 438</td>
<td>Intro Finite Element Method</td>
<td>3</td>
</tr>
<tr>
<td>CH 330</td>
<td>Transfer Process Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CH490</td>
<td>Elementary Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>CM 371</td>
<td>Phys Chem I</td>
<td>3</td>
</tr>
<tr>
<td>CM 372</td>
<td>Physical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>EC 311</td>
<td>Introduction to Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>EC 350</td>
<td>Economic Prin &amp; Eng Econ</td>
<td>3</td>
</tr>
<tr>
<td>EC 384</td>
<td>Game Theory/Economic Strategy</td>
<td>3</td>
</tr>
<tr>
<td>EE 264</td>
<td>Introduction to Digital Design</td>
<td>3</td>
</tr>
<tr>
<td>EM333</td>
<td>Elements of Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>ES 220</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>ES 222</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ES 223</td>
<td>Rigid Body Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ES 250</td>
<td>Electrical Science</td>
<td>3</td>
</tr>
<tr>
<td>ES 260</td>
<td>Materials Science &amp; Eng I</td>
<td>3</td>
</tr>
<tr>
<td>ES 330</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ES 340</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ES 400</td>
<td>Num &amp; Eng Computing</td>
<td>3</td>
</tr>
<tr>
<td>ES 405</td>
<td>Design of Exp &amp; Anlys of Data</td>
<td>3</td>
</tr>
<tr>
<td>ME 442</td>
<td>Eng Analy Using Finite Element</td>
<td>3</td>
</tr>
<tr>
<td>ME 443</td>
<td>Optimal Engineering</td>
<td>3</td>
</tr>
<tr>
<td>OM 331</td>
<td>Operations &amp; Supply Chain Mgt</td>
<td>3</td>
</tr>
</tbody>
</table>
PH 221  Theoretical Mechanics I  3
PH 231  Fundamentals of Modern Physics  3
PH 323  Optics  3
PH 325  Thermal Physics  3
PH 331  Quantum Physics I  3
PH 380  Electromagnetic Theory I  3
PH 381  Electromagnetic Theory II  3
PH 432  Quantum Physics II  3
PH 451  Statistical Mechanics I  3

74-75

Up to 12 credit hours of advanced (300- or 400-level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the department for details.

The following is a typical course sequence for the applied mathematics and statistics curriculum. Not all students will complete these courses in the outlined order.

### The Suggested Course Sequence for Applied Mathematics & Statistics Students

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 131</td>
<td>Calculus I</td>
<td>3</td>
<td>MA 132</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>PH 131</td>
<td>Physics I</td>
<td>4</td>
<td>PH 132</td>
<td>Physics II</td>
<td>4</td>
</tr>
<tr>
<td>CS 141</td>
<td>Intro to Comp Sci I</td>
<td>4</td>
<td>MA 200</td>
<td>Math Modeling &amp; Software</td>
<td>3</td>
</tr>
<tr>
<td>UNIV 190</td>
<td>The Clarkson Seminar</td>
<td>3</td>
<td>Knowledge Area Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FY 100</td>
<td>Freshmen Seminar</td>
<td>1</td>
<td>Free Elective (CS 142 recommended)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 211</td>
<td>Foundations</td>
<td>3</td>
<td>MA 231</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>MA 232</td>
<td>Elem Differential Equations</td>
<td>3</td>
<td>MA 339</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Science Elective</td>
<td></td>
<td>3</td>
<td>STAT 383</td>
<td>Probability &amp; Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Knowledge Area Elective</td>
<td></td>
<td>3</td>
<td>Knowledge Area Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Application Elective</td>
<td></td>
<td>3</td>
<td>Application Elective</td>
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<td></td>
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</tbody>
</table>

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#### Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 377</td>
<td>Numerical Methods</td>
<td>3</td>
<td>MA 363</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MA/STAT Elective (from list)</td>
<td></td>
<td>3</td>
<td>MA 451</td>
<td>Intro to Math Research</td>
<td>2</td>
</tr>
</tbody>
</table>

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#### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 377</td>
<td>Numerical Methods</td>
<td>3</td>
<td>MA 363</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MA/STAT Elective (from list)</td>
<td></td>
<td>3</td>
<td>MA 451</td>
<td>Intro to Math Research</td>
<td>2</td>
</tr>
</tbody>
</table>

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#### Fifth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 377</td>
<td>Numerical Methods</td>
<td>3</td>
<td>MA 363</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MA/STAT Elective (from list)</td>
<td></td>
<td>3</td>
<td>MA 451</td>
<td>Intro to Math Research</td>
<td>2</td>
</tr>
</tbody>
</table>

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#### Sixth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 377</td>
<td>Numerical Methods</td>
<td>3</td>
<td>MA 363</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MA/STAT Elective (from list)</td>
<td></td>
<td>3</td>
<td>MA 451</td>
<td>Intro to Math Research</td>
<td>2</td>
</tr>
</tbody>
</table>

15
<table>
<thead>
<tr>
<th>Knowledge Area Elective</th>
<th>3</th>
<th>MA/STAT Elective (from list)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Elective</td>
<td>3</td>
<td>Knowledge Area Elective</td>
<td>3</td>
</tr>
<tr>
<td>Free Elective</td>
<td>3</td>
<td>Application Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>15</td>
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<table>
<thead>
<tr>
<th>Seventh Semester</th>
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<th>Eighth Semester</th>
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<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
<td><strong>Cr. Hrs.</strong></td>
</tr>
<tr>
<td>MA/STAT Elective</td>
<td>3</td>
<td>MA/STAT Electives (from List)</td>
</tr>
<tr>
<td>Application Elective</td>
<td>3</td>
<td>Free Electives</td>
</tr>
<tr>
<td>Free Electives</td>
<td>9</td>
<td>MA 499 Profession Experience</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

This program is a 4-year program.
Mathematics and Statistics courses offered are listed in the section for the BS in Mathematics.
BS in Biology
Tom Langen, Program Chair

Biology is the study of life in all of its unique forms and complexity. Modern biology spans numerous research areas that explore the diversity of life at multiple levels of organization: molecules, cells, organ systems, species, ecosystems, and biosphere. The foundation of the Biology Program is a core curriculum of interactive classroom and laboratory experiences covering fundamental knowledge in biodiversity, cellular and molecular biology, genetics, microbiology, anatomy, physiology, and ecology. Biology majors typically pursue career paths in biotechnology, ecology and environmental science, or health-related professions.

The course curriculum for the Biology Major is designed to realize the following learning outcomes:

- Achieve proficiency in biology by mastering the core knowledge of the discipline and specializing in one or more subfields of the life sciences.
- Acquire scientific skills through inquiry-based laboratories and practical learning experiences that include the opportunity for directed study and thesis research guided by a professor.
- Develop the ability to think critically and solve problems though exposure to quantitative laboratory- and field-based research, primary research literature, and the history of biological science.
- Learn how to use appropriate technology, methodology and informational tools that accelerate progress in the workplace such as computer software, bioinformatics, genetic engineering, cell culture, microscopy, etc.
- Master oral and written communication skills essential for work in all fields of biology and the health professions.
- Develop social skills of interpersonal interaction including an awareness and appreciation of cultural diversity that enhances progress and enriches the pursuit of scientific endeavors.
- Gain strong appreciation of the importance of professional ethical behavior in society and the workplace.
- Obtain insight to current issues of bioethical concern ranging from preservation of global biodiversity to the improvement of human health through modern advances in biotechnology.
- Learn about career opportunities in the life sciences in preparation for seeking professional employment after graduation.

Upper-level Biology majors choose from a variety of elective courses that build upon fundamental principles and allow students to explore areas of personal interest. We encourage students to complement a program of bioscience courses drawn from research and teaching strengths of the department with relevant courses in other basic sciences, mathematics, engineering, business, and humanities. Students may also take advantage of courses offered through the Associated Colleges Program or the Clarkson Trudeau Biomedical Scholars Program (see below) to broaden their educational experience. The large array of choices in biological sciences can be used to tailor a customized career plan leading to graduate school or a professional degree program. Students interested in a more specialized background may consider interdisciplinary studies in chemistry, biomolecular engineering, mathematics, physics, psychology, environmental engineering, environmental science and policy, and environmental and occupational health.

Specific course requirements of the Biology Major are listed below, along with a suggested schedule. Students are guided throughout the year with personal advising and mentoring by Biology faculty.
members. Undergraduate participation in basic or applied research is highly encouraged and available through work in faculty laboratories, the senior thesis, summer research programs, and internships.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY 140</td>
<td>Biology I: Inheritance, Evolution &amp; Diversity</td>
<td>3</td>
</tr>
<tr>
<td>BY 142</td>
<td>Biology I Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BY 160</td>
<td>Biology II: Cell and Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>BY 162</td>
<td>Biology II Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BY 214</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BY 401</td>
<td>Professional Assessment</td>
<td>0</td>
</tr>
<tr>
<td>CM 131</td>
<td>Structure and Bonding &amp; Chemistry Lab I</td>
<td>4</td>
</tr>
<tr>
<td>(Or CM 103 &amp; CM 105)</td>
<td>General Chemistry I</td>
<td>3,2</td>
</tr>
<tr>
<td>CM 132</td>
<td>Equilibrium and Dynamics &amp; Chemistry Lab II</td>
<td>4</td>
</tr>
<tr>
<td>(or CM 104 &amp; CM106)</td>
<td>General Chemistry II</td>
<td>3,2</td>
</tr>
<tr>
<td>CM 241</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CM 242</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CM 244</td>
<td>Organic Chemistry Lab</td>
<td>3</td>
</tr>
<tr>
<td>PH 141 (or PH 131)</td>
<td>Physics for Life Sciences I (or Physics I)</td>
<td>4</td>
</tr>
<tr>
<td>PH 142 (or PH 132)</td>
<td>Physics for Life Sciences II (or Physics II)</td>
<td>4</td>
</tr>
<tr>
<td>Each of the following elective categories must be satisfied:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology Electives</td>
<td>21-23</td>
<td></td>
</tr>
<tr>
<td>Lab Electives</td>
<td>4-6</td>
<td></td>
</tr>
<tr>
<td>Math and Computer Science Electives</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Professional Experience</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75-79</td>
<td></td>
</tr>
</tbody>
</table>

**Elective categories:**

**Biology Electives**

Any course under the “BY” subject area

**Lab Elective**

Students must take two BY lab courses (200-level or higher), excluding BY 405 and BY 410

**Math and Computer Science Elective**

Three math or computer science courses (100-level or higher), including 1 calculus course and 1 statistics course

**Professional Experience**

One of the following courses: BY 405, BY 410, BY 495, BY 498, BY 499
The following is a typical course sequence for the biology curriculum. Not all students will complete these courses in the outlined order.

### The Suggested Course Sequence for Biology Students

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY 140</td>
<td>Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BY 142</td>
<td>Biology I Lab</td>
<td>2</td>
</tr>
<tr>
<td>CM 103</td>
<td>Structure and Bonding</td>
<td>3</td>
</tr>
<tr>
<td>CM 105</td>
<td>Chemistry Lab I</td>
<td>2</td>
</tr>
<tr>
<td>MA 180</td>
<td>Intro to College Math</td>
<td>4</td>
</tr>
<tr>
<td>UNIV 190</td>
<td>The Clarkson Seminar</td>
<td>3</td>
</tr>
<tr>
<td>FY 100</td>
<td>Freshmen Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total:** 18 Cr. Hrs.

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>BY 160</td>
<td>Biology II</td>
<td>3</td>
</tr>
<tr>
<td>BY 162</td>
<td>Biology II Lab</td>
<td>2</td>
</tr>
<tr>
<td>CM 104</td>
<td>Equilibrium &amp; Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>CM 106</td>
<td>Chemistry Lab II</td>
<td>2</td>
</tr>
<tr>
<td>MA 181</td>
<td>Basic Calculus</td>
<td>3</td>
</tr>
<tr>
<td>Knowledge Area Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total:** 16 Cr. Hrs.

#### Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM 241</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PH 141</td>
<td>Physics for Life Science I</td>
<td>4-5</td>
</tr>
<tr>
<td>BY Lab Elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Knowledge Area Elective</td>
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<td></td>
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</tbody>
</table>

**Total:** 14-15 Cr. Hrs.

#### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY 214</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>CM 242</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CM 244</td>
<td>Organic Chemistry Lab II</td>
<td>3</td>
</tr>
<tr>
<td>PH 142</td>
<td>Physics for Life Science II</td>
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<tr>
<td>Statistics elective</td>
<td>3</td>
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**Total:** 16 Cr. Hrs.

#### Fifth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Knowledge Area Elective</td>
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<td></td>
</tr>
<tr>
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**Total:** 15 Cr. Hrs.

#### Sixth Semester

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**Total:** 13-14 Cr. Hrs.

#### Seventh Semester

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#### Eighth Semester

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**Total:** 12 Cr. Hrs.
The Clarkson Trudeau Biomedical Scholars Program

The Clarkson Trudeau Biomedical Scholars Program is an intensive semester-long living and learning experience (the “Trudeau Semester”) and a separate summer research program that both take place off campus at the renowned Trudeau Institute in Saranac Lake, New York.

The 15-credit program Trudeau Semester is an undergraduate program designed to provide a select group of undergraduate students the opportunity to learn multidisciplinary aspect of bioscience related to the human health field. The program is specifically designed for students from the majors of Biology, Biomolecular Science, Chemistry, and Chemical and Biomolecular Engineering, and also serves as a professional experience. The Trudeau Semester is taught by Clarkson and Trudeau Institute faculty who are respective experts in their field. The academic program provides a range of disciplines that by design will each contribute to a related topic that is the focus of a semester-long, integrative project that aims to demonstrate how technology serves humanity, a core Clarkson value.

Students study and conduct a research project at the Trudeau Institute located approximately one mile from their townhouse residences in Saranac Lake. At the Trudeau Institute there is dedicated laboratory space for instruction and study offices, as well as an office for a faculty member. Each course is 3 weeks in duration, with the exception of the Term Integrated Research Project, which the students are involved with the entire semester. Students present their research findings at the Symposium for Undergraduate Research Experiences conference that takes each semester on the Clarkson University Campus, in addition to a public presentation.

BS in Biomolecular Science

Phillip Christiansen, Program Director

Science has undergone a remarkable transformation over the last few years, and nowhere has the impact been so dramatic as at the interface between biology and chemistry — the bio-molecular sciences. Recent developments in biotechnology, biofuels, pharmaceuticals, genetic engineering and medicine have been truly astounding and will only continue throughout the 21st century. Few sciences will have the impact on our lives as this one, and few offer the opportunities for individuals to make such a vast variety of contributions. Clarkson University’s program in Biomolecular Science is designed to:

- Provide students with the knowledge base to meet the challenges of professional careers spanning the full range of the chemical and biosciences.
- Provide an intellectually stimulating environment, including exposure to open-ended problems of the type encountered in industry, graduate school and professional programs in the health sciences.
- Provide an environment that ensures students the opportunities to develop communication skills and professional relationships.

This is a truly interdisciplinary program, building on strong foundations in both chemistry and biology, and finishing with capstone courses and labs in biochemistry, molecular biology and biotechnology. Professional and free electives allow students to build specializations and to participate in faculty-directed research, a “trademark” of science education at Clarkson.
Careers span the full range of the chemical and biological sciences, with exceptional opportunities in the pharmaceutical and medical industries, in biotechnology and genetic engineering, biofuels, forensics and the health sciences. The program at Clarkson is also excellent preparation for entrance into professional schools in medicine and dentistry, or for the Doctor of Physical Therapy or Physician Assistant programs at Clarkson.

**REQUIREMENTS**

**Biology (24 credits)**
- BY140 Life’s Diversity
- BY160/162 Cell and Molecular Biology with Lab
- BY214 Genetics
- BY412 Molecular Biology
- BY450/451 Biochemistry I and II
- BY470 Biotechnology Lab

**Chemistry (31 credits)**
- CM103/105 Structure and Bonding with Lab
- CM104/106 Equilibrium and Dynamics with Lab
- CM221/223 Spectroscopy with Lab
- CM241/242 Organic Chemistry I and II

**Professional Electives and Prof. Experience (12 credits)**
- CM244 Organic Chemistry Lab
- CM371/372 Physical Chemistry I and II

**Physics and Math (17 credits)**
- PH131/132 Physics I and II
- MA131/132 Calculus I and II

**Statistics**
- BY412 Molecular Biology

**Clarkson and First-Year Seminars (4 credits)**

**Knowledge Areas (including a University Course) in addition to BY214 (12 credits)**

**Free Electives (15 credits)**

Total — 120 credits

**Biomolecular Science Sample Curriculum**

**FIRST YEAR**

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**TOTAL — 15 CREDITS**
**SOPHOMORE YEAR**

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**JUNIOR YEAR**

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**SENIOR YEAR**

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</table>
BS in Chemistry
Devon Shipp, Program Chair

Chemistry is the most central of sciences. It deals with the properties, composition and structure of matter, with the changes that occur in matter and with energy relationships involved in those changes. Chemistry has been at the forefront of virtually all recent advances in materials, medicine and renewable fuels. The chemistry program at Clarkson has been designed to:

- Provide students with a core knowledge base to meet the challenges of professional careers spanning the full range of the chemical sciences.
- Ensure that students have the opportunity to develop strong professional communication skills.
- Provide a stimulating intellectual environment with exposure to open-ended problems likely to be encountered in industry, graduate schools and professional programs.

It is a rigorous degree program and students completing the requirements may be certified by the American Chemical Society if so desired. At the same time, it has the flexibility to allow students to develop the specialities that best meet their career goals. The small laboratory learning environment provides strong interaction between students and with instructors and the laboratory, as well as research experiences provide students ample opportunities to develop communication skills through small group presentations and reports. The chemistry faculty are internationally known for the quality of their research, and undergraduates are encouraged to become involved in research with the faculty and graduate students as early as their freshman year.

A pre-health sciences program is available for students interested in medical school or a health-care related field. Clarkson also offers a pre-physical therapy undergraduate concentration which prepares students for the entry level Doctor of Physical Therapy degree program, as well as the pre-physician assistant undergraduate program leading to the Masters of Physician Assistant Studies degree program.

REQUIREMENTS

Chemistry (45 credits)
CM103/105 Structure and Bonding with Lab
CM104/106 Equilibrium and Dynamics with Lab
CM121 Freshman Seminar
CM221/223 Spectroscopy with Lab
CM241/242 Organic Chemistry I and II
CM244 Organic Chemistry Lab
CM300 Instrumental Lab
CM312 Inorganic Chemistry
CM320 Separations and Electrochemistry
CM345 Advanced Lab
CM371/372 Physical Chemistry I and II

Biology Elective (3 credits)

Physics and Math (20 credits)
PH131/132 Physics I and II
MA131/132 Calculus I and II
MA232 Differential Equations
Statistics

Clarkson and First-Year Seminar,
Knowledge Areas, University
Course and Professional Experience
(22 credits)

Free Electives (29 credits)

Total — 120 credits
# Chemistry Sample Curriculum

## FIRST YEAR

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## SOPHOMORE YEAR

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## JUNIOR YEAR

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<td>CM312</td>
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16
### SENIOR YEAR

**(Standard Option)**

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**First Semester**

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**Second Semester**

### (Thesis Option)

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<td>Undergraduate Thesis</td>
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</table>

1 With the permission of the department chair, CM131-132 may be accepted in lieu of CM103-106 for a student who wishes to transfer into the Department of Chemistry after having completed the first year in another department.

2 Those students wishing to satisfy the requirements for an American Chemical Society-accredited BS degree will need at least six credit hours in advanced chemistry electives, including biochem I. Thesis can count for only three such credits. Those students electing the standard option need at least one credit hour of an elective chemistry laboratory course.
BS in Communication
Bill Karis, Program Chair

Program Goals
Clarkson’s Communication degree integrates communication, design and technology. Students develop a repertoire of communication skills and a solid understanding of communication theory and practice. Together these prepare students to pursue professional careers or graduate programs in this dynamic field.

Starting with a set of five required courses, students develop abilities which are the foundation of any successful 21st century career in communication: writing, speaking, graphic design, media design, teamwork and communication theory. Students then enhance and deepen these abilities through seven additional communication courses, which can be focused in areas like new media or technical communication. Students may select specific courses or, in conjunction with Communication & Media faculty, design independent study projects to further personal and professional interests.

Our faculty takes advantage of Clarkson’s technological environment to provide instruction in writing, speaking, graphic design, digital video, digital audio, web design, information design, usability testing, public relations, environmental communication, and social media. Students work with C&M faculty in experiential learning projects, ongoing research activities, and regular classes to learn, design and experiment with the latest communication practices.

- **Outcome 1:** Students will develop informative and persuasive communication skills.
- **Outcome 2:** Students will develop competencies in a range of communication technologies.
- **Outcome 3:** Students will develop an ability to work effectively and ethically in the professional workplace.
- **Outcome 4:** Students will develop the ability to critically analyze language and media use in society and the workplace.

Program Requirements
Communication majors take five required COMM courses: COMM 210 Rhetoric for Business, Science and Engineering, COMM 341 Introduction to Web Design, a COMM 300 level professional communication course and a COMM 400 level communication theory course chosen from lists maintained by the Communication & Media Department, COMM 490 Communication Internship, and seven other elective COMM courses, such as COMM 217 Public Speaking, COMM 100 2D Digital Design, COMM 310 Mass Media & Society, COMM 327 Digital Video 1, COMM 322 Typography & Design, and COMM 360 Audio Production.

In addition, the general requirements for the BS in Communication ensure that students have substantial exposure to mathematics, science, technology, computing, and liberal arts. Communication majors are also required to obtain 15 credit hours in an external field (e.g., biology, computer science, digital arts, history, business, information technology, psychology) which often provides them with a secondary field for further personal or professional development.
Students can use the remaining credits required for graduation to pursue individual interests or career goals. COMM 490 (Internship) serves as a bridge to industry or to advanced study in the field. Students may choose to complete their internship by doing professional communication work for offices on campus or for off-campus businesses and organizations.

Students may earn a double major by fulfilling the requirements for the BS in Communication and another discipline at Clarkson, often without overload coursework. Students pursuing other majors may acquire a minor in Communication.

**Social Documentation Double Major**

Social Documentation is a double major integrating a Communication major with a social science, humanities, or liberal studies major. It emphasizes critical inquiries into societal issues along with the study of recording and documenting theories, techniques and technologies. A substantive knowledge base in a social science or humanities discipline enables students to ground their Communication degree in an area of interest that will also give them a distinctive perspective. Likewise, the critical thinking, persuasive, and media production skills learned from the Communication program will empower the social science or humanities major to more effectively create products that can influence, entertain or educate. For more information, see the Social Documentation sample Curriculum section.

**Degree Requirements:** Along with meeting the requirements of the Clarkson Common Experience, Communication majors must fulfill the following requirements:

<table>
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<tbody>
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<td>Mathematics Courses (include Stat 282)</td>
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<td>COMM210 Theory of Rhetoric for Business, Science and Engineering</td>
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<td>Science Courses (includes lab course)</td>
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<td>COMM490 Communication Internship</td>
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<td>Plus 7 Communication Courses</td>
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**EXTERNAL FIELD: 15 hours**

Five courses to be chosen in consultation with advisor in a subject area outside the Communication major, such as the following:

- Biology
- Business
- Chemistry
- Computer Science
- Digital Arts & Sciences
- Environmental Science & Policy
- History
- Information Technology
- Mathematics
- Physical Therapy
Students choose the remaining hours to fulfill remaining Knowledge Areas, to take additional Communication courses, or additional liberal arts, engineering, business, or science courses; to pursue another external field; to transfer credit from junior and community colleges; to double major; or to design individual areas of study.

The Communication program is designed to be flexible. In most cases, students work closely with faculty to arrange an appropriate sequence of courses. The following eight-semester plan is typical only in that it indicates students should take the general requirements before pursuing the external field requirement. Since all courses are not offered each semester, and since some courses in the external field may have prerequisites, students should seek guidance from the Communication and Media Department in planning their academic programs.

### Communication Sample Curriculum

#### FIRST YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>COMM210</td>
<td>Theory of Rhetoric</td>
</tr>
<tr>
<td>COMM310</td>
<td>Mass Media &amp; Society</td>
</tr>
<tr>
<td>UNIV190</td>
<td>The Clarkson Seminar</td>
</tr>
<tr>
<td>MA180</td>
<td>Intro to College Math</td>
</tr>
<tr>
<td>BY130</td>
<td>Science Elective</td>
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<tr>
<td>FY100</td>
<td>First-Year Seminar</td>
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#### SOPHOMORE YEAR

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>COMM341</td>
<td>Intro to Web Design</td>
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<tr>
<td>COMM Elective</td>
<td>3</td>
</tr>
<tr>
<td>External Field</td>
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</tr>
<tr>
<td>Computer Course (TECH)</td>
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</tr>
<tr>
<td>Elective</td>
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</table>
JUNIOR YEAR

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>COMM Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MA/SC/Computing Elective</td>
<td></td>
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<tr>
<td>Elective</td>
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<tr>
<td>External Field</td>
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<tr>
<td>Elective</td>
<td></td>
<td>3</td>
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Second Semester

<table>
<thead>
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<th>Cr. Hrs.</th>
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<tbody>
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<td>COMM Elective</td>
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<td>3</td>
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<tr>
<td>Elective</td>
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<tr>
<td>External Field</td>
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<tr>
<td>Computer Elective</td>
<td></td>
<td>3</td>
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<tr>
<td>Elective</td>
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SENIOR YEAR

First Semester

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<td>From C&amp;M List</td>
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<tr>
<td>COMM490</td>
<td>Internship</td>
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Second Semester

<table>
<thead>
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<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
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<tr>
<td>Electives</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

BS in Computer Science

Christopher A. Lynch, Program Chair

Computer technology plays a critical role in virtually every business and institution. It is an essential tool in every branch of science and engineering. Many forms of art and entertainment are centered on computer technology. Computer scientists are professionals who understand the technology and have the skills to develop and apply it.

Many computer scientists work as software developers who design, implement, test and maintain computer software. They can also work as information technology specialists who deploy and manage information technology, including computer systems, computer networks, database systems and web technology. Some are researchers who invent new technology or study its theoretical foundations.

The Computer Science major is organized into four options. The General option is the most flexible. It allows students to tailor their program of study to a wide variety of professional and personal goals. The other three options prepare students for the specific career paths mentioned above: Software Design and Development, Information Technology and Research. The requirements of the General option are shown
The first five semesters of the sample schedule shown below are common to all options of the CS major. In addition to the requirements specific to the CS major, students must also satisfy the requirements of the Clarkson Common Experience.

The Computer Science major is designed so that by the time they graduate, students should be able to:

- demonstrate a solid understanding of the core concepts of computer science and some advanced topics in computer science;
- reason clearly and analytically about software and computing systems;
- work effectively with a variety of programming languages, software tools and computing environments;
- solve substantial real-world problems;
- communicate effectively orally and in writing;
- work effectively in teams; and
- use computer science literature and other similar resources for independent study or to research the solution to a computing problem.

In addition to the general undergraduate requirements, students majoring in Computer Science must complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CS 141*</td>
<td>Intro to Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CS 142*</td>
<td>Intro to Computer Science II</td>
<td>3</td>
</tr>
<tr>
<td>CS 241*</td>
<td>Computer Organization</td>
<td>3</td>
</tr>
<tr>
<td>CS 242*</td>
<td>Adv Programming Concepts in Java</td>
<td>3</td>
</tr>
<tr>
<td>CS 341</td>
<td>Programming Languages</td>
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</tr>
<tr>
<td>CS 344</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CS/MA 345</td>
<td>Automata Theory and Formal Languages</td>
<td>3</td>
</tr>
<tr>
<td>CS 350</td>
<td>Software Design &amp; Development</td>
<td>3</td>
</tr>
<tr>
<td>CS 444</td>
<td>Operating Systems</td>
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<tr>
<td>CS 499</td>
<td>Professional Experience</td>
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<tr>
<td>MA 131</td>
<td>Calculus I</td>
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</tr>
<tr>
<td>MA 132</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MA 211</td>
<td>Foundations</td>
<td>3</td>
</tr>
<tr>
<td>MA 339</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>or MA 239</td>
<td>Elementary Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>STAT 383</td>
<td>Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or MA/STAT 381</td>
<td>Probability</td>
<td>3</td>
</tr>
<tr>
<td>Science Electives</td>
<td>One 2-course lecture/lab sequence in CM or PH, plus 4 additional credits in CM, PH, or BY</td>
<td>12</td>
</tr>
</tbody>
</table>

- CS Electives I (3 courses) Any 3-credit CS 400-level course (excluding CS 407, 408, 411, 412, 497, & 498) 9
- CS Electives II (2 courses) Any 3-credit CS 400-level course, EE 368, EE 466, IS 314, COMM 440, COMM 442, or COMM 444. 6

*Or equivalent
Up to 12 credit hours of advanced (300- or 400-level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the department for details.

The following is a typical course sequence for the computer science curriculum. Not all students will complete these courses in the outlined order.

### The Suggested Course Sequence for Computer Science Students

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 141</td>
<td>Intro to Comp Sci I</td>
<td>4</td>
<td>CS 142</td>
<td>Intro to Comp Sci II</td>
<td>3</td>
</tr>
<tr>
<td>MA 131</td>
<td>Calculus I</td>
<td>3</td>
<td>MA 132</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>Science Sequence Course I</td>
<td>4</td>
<td>Science Sequence Course II</td>
<td>4</td>
<td></td>
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</tr>
<tr>
<td>UNIV 190</td>
<td>The Clarkson Seminar</td>
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<td>Knowledge Area Elective</td>
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<tr>
<td>FY 100</td>
<td>Freshmen Seminar</td>
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<td>Free Elective</td>
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<td><strong>Total</strong></td>
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#### Second Semester

<table>
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<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 242</td>
<td>Advanced Progrmng Concepts</td>
<td>3</td>
<td>CS 241</td>
<td>Computer Organization</td>
<td>3</td>
</tr>
<tr>
<td>MA 211</td>
<td>Foundations</td>
<td>3</td>
<td>CS 344</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>Science Elective</td>
<td>4</td>
<td>MA 339</td>
<td>Applied Linear Algebra</td>
<td>3</td>
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</tr>
<tr>
<td>Knowledge Area Elective</td>
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<td>Knowledge Area Elective</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Elective</td>
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<td>Free Elective</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
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<td></td>
<td><strong>Total</strong></td>
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</table>

#### Third Semester

#### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
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<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>CS 341</td>
<td>Programming Languages</td>
<td>3</td>
<td>CS 444</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CS 345</td>
<td>Automata Theory</td>
<td>3</td>
<td>STAT 383</td>
<td>Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>CS 350</td>
<td>Software Des &amp; Dev</td>
<td>3</td>
<td>CS Elective</td>
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</tr>
<tr>
<td>Knowledge Area Elective</td>
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<td>Knowledge Area Elective</td>
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<td></td>
</tr>
<tr>
<td>Free Elective</td>
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<td>Free Elective</td>
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<td><strong>Total</strong></td>
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#### Fifth Semester

#### Sixth Semester

<table>
<thead>
<tr>
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<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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<tr>
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<td>CS Electives</td>
<td>6</td>
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</tr>
</tbody>
</table>
This is a 4-year program

**BS in Digital Arts & Sciences**

*Bill Karis, Chair of Communication & Media; Christopher A. Lynch, Chair of Computer Science*

Digital Arts & Sciences (DA&S) is a multidisciplinary BS degree spanning the boundaries between the sciences and the arts. DA&S students benefit from an education in both the artistic and scientific aspects of digital media. The program prepares students for career opportunities in a wide range of fields — such as working with film and video gaming companies, mobile and web application design and development, computational science research (scientific visualization and simulation), interactive display systems and immersive experience design.

Students take advantage of programs in digital art, math, computer science and communication & media. The program’s objective is to combine artistic and scientific skills and interests to develop creative talent with a strong technical foundation.

The curriculum for the Digital Arts & Sciences Major is designed to achieve the following outcomes:

- Develop a strong interdisciplinary foundation in the digital arts, mathematics, and computer science fields
- Specialize in one or more areas of advanced study in the program
- Acquire artistic and scientific skills through project-based assignments that include the opportunity for directed study and thesis projects guided by a professor
- Experience working in a collaborative, team-based atmosphere for large-scale projects that are designed to emulate real-world situations and problems
- Learn how to utilize technological, traditional and experimental methods of creative and analytical problem-solving
- Master oral, visual, and written communication skills essential for work in all fields of the arts and sciences
- Learn about career opportunities in the arts and sciences in preparation for seeking professional employment or advanced academic study after graduation
- Create a portfolio of artistic and scientific research which demonstrates the knowledge gained as a student in the program

DA&S students benefit from small classes and personal attention. The DA&S major is strengthened by Clarkson’s technology-rich environment. Students have access to state-of-the-art facilities and experiences such as:

- Eastman Kodak Center for Excellence in Communication
- Usability Testing Laboratory
- Virtual Reality Discovery Laboratory
- Clarkson Open Source Institute
Digital Art Software and Programs
Digital Arts Visualization Lab
Digital Arts Experimental Studio
Industry Standard Art & Design Software
Digital Video and Audio Equipment
2D and 3D Printing Technology
Audio Production Studio
Motion Capture Equipment
Field Trips to International Digital Arts Festivals, Conferences and Companies

Digital Art Portfolio Development
DA&S students develop their research and creative abilities through an extensive portfolio development process spanning multiple semesters. The culminating project, a digital art portfolio, requires each DA&S student to demonstrate his or her creative ability and technical prowess in a variety of media choices, using a wide range of digital tools. The portfolio will tangibly demonstrate a student’s skills and potential, and will prove to be a key first-step in leading to job opportunities and/or entry to graduate school.

In addition to the general undergraduate requirements (see below*), students majoring in Digital Arts & Sciences must complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA 100</td>
<td>Intro to Digital Art</td>
<td>3</td>
</tr>
<tr>
<td>DA 110</td>
<td>Drawing</td>
<td>3</td>
</tr>
<tr>
<td>DA 120</td>
<td>Elements of Design</td>
<td>3</td>
</tr>
<tr>
<td>DA 140</td>
<td>Introduction to Digital Art: Form &amp; Code</td>
<td>3</td>
</tr>
<tr>
<td>DA 212</td>
<td>Art in Context</td>
<td>3</td>
</tr>
<tr>
<td>2 x DA 2__ level or higher</td>
<td>DA Electives</td>
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<tr>
<td>2 x DA 3__ level or higher</td>
<td>DA Electives</td>
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<tr>
<td>DA 491</td>
<td>Professional Practice</td>
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<td>DA 492</td>
<td>Senior Studies</td>
<td>3</td>
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<tr>
<td>CS 141 (TECH)</td>
<td>Intro to Computer Science I</td>
<td>4</td>
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<tr>
<td>CS 142</td>
<td>Intro to Computer Science II</td>
<td>3</td>
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<tr>
<td>CS 242</td>
<td>Adv Programming Concepts in Java</td>
<td>3</td>
</tr>
<tr>
<td>MA 131</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MA 230</td>
<td>3-D Space and Projective Geometry</td>
<td>3</td>
</tr>
<tr>
<td>MA 239</td>
<td>Linear Algebra</td>
<td>3</td>
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<tr>
<td>MA 277</td>
<td>Introduction to Computational Sciences</td>
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</tr>
<tr>
<td>MA/CS ***</td>
<td>Electives</td>
<td>9</td>
</tr>
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</table>

General Undergraduate Requirements
STAT 282/381/383 Probability and Statistics | 3 |
PH 131/141 Science course with lab PH 131/141 required | 4 |
NAT SCI Science course | 3 |
Electives Free Electives* | 42 |
UNIV 190 University Course | 3 |
Free Electives will cover Knowledge Area courses as needed.

*Clarkson Common Experience Requirements*
- UNIV 190 Clarkson Seminar
- Five Knowledge Area (KA) courses; must collect four different KA’s from the six available KA’s (one course must be a UNIV course (covers two KA’s).
  - Contemporary & Global Issues (CGI)
  - Cultures & Society (CSO)
  - Economics & Organizations (EC)
  - Imaginative Arts (IA)
  - Individual & Group Behavior (IG)
  - Science, Technology & Society (STS)
- Communications Points: Total of 6 points, at least 2 points must be in Major courses at 300+ level.

**Further Requirements**
Additional credits in electives to bring total credits to 120.

Students must also meet the Common Experience requirements for communication points and a technology course, though it is anticipated that the required courses will satisfy these. MA231 Calculus III satisfies the MA230 requirement for double majors or changes of major.

### Digital Arts & Sciences Sample Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA110</td>
<td>Drawing</td>
<td>3</td>
<td>DA100</td>
<td>Intro to Digital Art</td>
<td>3</td>
</tr>
<tr>
<td>MA131</td>
<td>Calculus I</td>
<td>3</td>
<td>MA230</td>
<td>3-D Space &amp; Proj. Geom.</td>
<td>3</td>
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<tr>
<td>DA120</td>
<td>Elements of Design</td>
<td>3</td>
<td>DA140</td>
<td>Intro to Digital Art: Form &amp; Code</td>
<td>3</td>
</tr>
<tr>
<td>UNIV190</td>
<td>Clarkson Seminar</td>
<td>3</td>
<td>Elective</td>
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</tr>
<tr>
<td>FY100</td>
<td>First-Year Seminar</td>
<td>1</td>
<td>Elective</td>
<td>3</td>
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**FIRST YEAR**

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
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<td>13</td>
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</tr>
</tbody>
</table>
### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA2__</td>
<td>200 Level DA Course or above</td>
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<td>DA___</td>
<td>200 Level DA Course or above</td>
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</tr>
<tr>
<td>DA212</td>
<td>Art in Context</td>
<td>3</td>
<td>MA/CS</td>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>CS141</td>
<td>Computer Science I</td>
<td>4</td>
<td>CS142</td>
<td>Computer Science II</td>
<td>3</td>
</tr>
<tr>
<td>MA239</td>
<td>Elementary Linear Algebra</td>
<td>3</td>
<td>Elective</td>
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</tr>
<tr>
<td></td>
<td>Elective</td>
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<td>Elective</td>
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### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>CS242</td>
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<td>MA277</td>
<td>Introduction to Computational Sciences</td>
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### Senior Year

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BS in History
Bill Vitek, Program Chair

Program Goals
History examines human experience, confronting students with facets of human life in the past and in the present. The history major at Clarkson provides students with the opportunity to learn about lives, times, and places distant from their own, and it provides them with the tools to think about them critically, gaining a greater understanding of the complexities of their world.

Students majoring in History will:
- Appreciate history as an interpretive discipline
- Have a broad understanding of history
- Demonstrate mastery of appropriate research methodologies in history by producing a capstone research paper
- Gain expertise in using technology to explore historical problems

History majors work closely with their advisors to develop a coherent program of study. In addition to courses in American History and Gender & Sexuality studies, students have the unique opportunity to develop areas of expertise generally unavailable at liberal arts colleges, by taking sets of history courses focused on Science, Medicine, Technology, and Society; War Studies; and the Ancient, Medieval and Renaissance World. Through their History major at Clarkson, students will also gain the ability to:
- Write clearly and persuasively
- Speak effectively in a group setting
- Think critically
- Understand and analyze complex problems
- Examine and interpret evidence
- Organize and synthesize large amounts of information
- Approach current issues with historical perspective

Program Requirements *
120 credit hours, including:
- 1 credit Introduction to the Liberal Arts pre-seminar
- 9 courses in history, including:
  - 6 courses at the 300-level or above
  - 1 course in pre-modern history
  - 1 course in modern history
- Humanities/Social Sciences Research Seminar
- 5 courses in a pre-professional external field
- Fulfillment of the requirements of the Clarkson Common Experience

Students majoring in History are required to take at least five courses in a pre-professional external field, such as pre-law, pre-med, pre-physical therapy, business or communications and media. This concentration provides students with opportunities to increase career choices, while at the same time exploring a wide variety of interests through their major. Finally, history majors will be encouraged:
- To Study Abroad. Students who study abroad should take at least one course in the history of their host country.
- Do Historical Internships, for example, at local historical museums.

* Courses taken to fulfill requirements for a Humanities/Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social Sciences Minor.

**History Sample Curriculum**

**FIRST YEAR**

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Length of Program: 8 semesters
BS in Humanities
BS in Interdisciplinary Liberal Studies
BS in Interdisciplinary Social Sciences
Bill Vitek, Program Chair

Program Goals
Clarkson offers interdisciplinary bachelor of science degrees in Humanities, Social Sciences and Liberal Studies. Students can also minor in these areas, as well as in interdisciplinary thematic areas.

The Humanities, Interdisciplinary Social Sciences and Interdisciplinary Liberal Studies programs challenge students to think critically and incisively about ideas, people, society and the human condition. Students learn about, think about, and come to understand the issues and problems of the contemporary world and of the past. They learn about the diversity and the complexity of social life, past and present. They learn how the human condition and human experience have been captured in literature and art. And they learn the ways in which people have sought to understand their lives through philosophical inquiry.

These degree programs offer a great deal of flexibility, allowing a student substantial elective choice. Each student works closely with an advisor to select both major and elective courses that meet his or her educational and career goals. Students minoring in the department also choose the courses in their programs in consultation with their advisors.

Courses in the Interdisciplinary Social Sciences, Humanities or Liberal Studies majors at Clarkson offer students intellectually challenging opportunities to help them:

- Gain critical perspectives on themselves and the world
- Understand the complexities of open-ended human problems
- Achieve awareness of cultural and social diversity
- Assess the ethical and social implications of science, technology and business
- Engage in and appreciate the creative process

Through their Interdisciplinary Social Science, Humanities or Liberal Studies major at Clarkson, students will also gain the ability to:

- Write clearly and persuasively
- Speak effectively in a group setting
- Think critically
- Understand and analyze complex problems
- Examine and interpret evidence
- Organize and synthesize large amounts of information

Program Requirements*
120 credit hours, comprising:

- 1 credit Introduction to the Liberal Arts pre-seminar
- 8 courses with an appropriate topical or thematic focus
- The Humanities/Social Sciences Research Seminar
- 5 courses in a pre-professional external field
- Fulfillment of the requirements of the Clarkson Common Experience
Students majoring in Interdisciplinary Social Science, Humanities or Liberal Studies at Clarkson are required to take at least five courses in a pre-professional external field, such as pre-law, pre-med, pre-physical therapy, business, or communications and media. This pre-professional concentration provides students with opportunities to increase career choices, while at the same time exploring a wide variety of interests through their major.

* Courses taken to fulfill requirements for a Humanities/Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social Sciences Minor.

Sample Curriculum for Humanities, Interdisciplinary Liberal Studies and Social Sciences

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*Major courses are those designated Anthropology, Film Studies, History, Literature, Philosophy, Political Science, Social Sciences or Science Technology and Society Sociology.
Concentration in Gender & Sexuality Studies

The Concentration in Gender & Sexuality studies is a curricular option available within either the BS in Interdisciplinary Social Sciences or the BS in Interdisciplinary Liberal Studies degree programs. To complete this concentration, all students must:

1. Satisfy the requirements for the BS in Interdisciplinary Social Sciences or the BS in Interdisciplinary Liberal Studies degree programs (10 courses in the major—one Introduction to Liberal Arts, one Major Research Seminar, and eight content courses).
2. Take 15 credit hours (five courses) in Gender and Sexuality Studies, structured as follows:
   a. Students must take SS 220, Introduction to Gender, or SS 221, Introduction to Sexuality, as well as four courses from an approved list of Gender and Sexuality Studies courses maintained by the Humanities and Social Sciences department.
   b. Three of the five Gender and Sexuality Studies courses may be used to substitute for three of the required content courses in the major. The other two Gender and Sexuality Studies courses may be used to satisfy undesignated electives.

Students who complete the Gender & Sexuality Studies Concentration will have this noted on their transcripts.

BS in Mathematics

Joseph Skufca, Program Chair

Mathematics is the study of numbers, functions, geometrical forms, and abstract logical structures and their associated relationships. In addition to providing an essential foundation for scientific and technical fields, mathematics is studied both for its own intellectual appeal and challenge and for its application to real-life problems. Students of mathematics also develop critical thinking and analytical skills useful for a wide variety of careers.

The mathematics program at Clarkson is rigorous and demanding, yet flexible enough to allow students to sample many disciplines or focus on a special interest. Many mathematics students also complete a minor or double major in a field such as computer science, physics, biology, or business. Students are encouraged to participate in research projects with faculty, starting as early as their freshman year. Graduates work in industry, business, or government agencies as mathematicians, statisticians, and actuaries. Many continue their education in graduate programs in mathematics or related fields; some become mathematics teachers or professors.

The mathematics curricula are designed so that students learn to:
- reason clearly, logically, and analytically;
- demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics;
- work effectively with standard mathematical software packages and write mathematical programs using a high-level computer language;
- apply mathematical knowledge to solve real-world, open-ended problems;
- read mathematical texts and literature and write mathematical proofs;
- communicate effectively, both orally and in writing; and
- work effectively both individually and in teams.
The mathematics major has two options. The mathematics option (detailed below) is designed for students with a general interest in mathematics and is excellent preparation for graduate school. The statistics option replaces some mathematics courses in the junior and senior years with statistics courses, and is designed to prepare students for careers as statisticians or actuaries. The department also offers a separate major in Applied Mathematics and Statistics.

**Requirements**

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<td>Physics (PH131 and PH132)</td>
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<tr>
<td>Free electives**</td>
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120

*Required courses MA131, MA132, MA200, MA211, MA231, MA232, MA321, MA339, MA499, and STAT383, plus either MA451 or MA453 and MA431. The Math Option also requires two of MA311, MA313, MA314, and MA322; the Statistics Option also requires STAT381, STAT382, STAT384, and STAT488.

** Up to 12 credit hours of advanced (300- or 400-level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the department for details.

**Sample Curriculum**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
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15 16
## SOPHOMORE YEAR

### First Semester

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## JUNIOR YEAR

### First Semester

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<td>MA 322</td>
<td>Advanced Calculus II (or MA314)</td>
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### Second Semester

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This is a 4 year program
BS in Physics
Dipankar Roy, Program Chair

Physics, the most fundamental of the sciences, deals with the behavior and interaction of matter, energy, space and time. It is in Physics where the basic concepts, laws and measuring techniques have been developed in the broad areas of mechanics, heat and thermodynamics; wave motion, acoustics, optics, electricity and magnetism; and the structure of matter. The concepts and techniques of Physics are the foundations of the other Sciences and of Engineering. Clarkson’s Physics curriculum has been designed to meet the following goals:

- Present the fundamental knowledge needed for professional work in industry or graduate school, while including many free electives.
- Offer a flexible curriculum to satisfy diverse career objectives and make it possible to double major in Physics and other fields.
- Provide plenty of opportunity to get involved in active research as an undergraduate.

A double major with physics at Clarkson can be completed within four years. In addition to providing a flexible double major program, the Physics curriculum strongly emphasizes undergraduate research. PhD. Students often identify research projects in their areas of concentration and continue to work on the project until graduation. Student research frequently leads to publication in internationally recognized scientific journals. The typical length of the Physics BS is eight semesters (four years).

Three-Year Accelerated Degree Program
This program is available to students who arrive at Clarkson University with excellent preparation from high school. Its challenging pace requires harder work than the standard program and special dedication, but offers the opportunity to complete a degree in a shortened time span. Students in this accelerated program may save educational costs and enter the job market earlier.

REQUIREMENTS
Specific course requirements of the Physics Major are listed below, along with a sample (tentative) 8-semester plan.

<table>
<thead>
<tr>
<th>Area</th>
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<th>Cr. Hrs.</th>
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<tr>
<td>First-Year Seminar</td>
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<td>Communications Elective(^{(3)}) (C2)</td>
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<td>Knowledge Area and University</td>
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<td>Physics(^{(1)}) (or equivalent)</td>
<td>35</td>
<td>Course Electives</td>
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<tr>
<td>Mathematics(^{(2)})</td>
<td>18</td>
<td>Concentration Electives(^{(4)})</td>
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<td>Chemistry</td>
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<td>Information Technology Elective</td>
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<tr>
<td>Biology Elective</td>
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<td>Technology Elective</td>
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<tr>
<td></td>
<td></td>
<td>[including a C1 course(^{(5)})]</td>
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<tr>
<td>Total</td>
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Includes *Physics Professional Requirement* courses: PH 121, PH 232, PH 327, PH 331 (part of the Core Curriculum), and 3 credits from the list: PH 445, PH 446, PH 470-477 (Physics Professional Electives).

Mathematics courses for a Physics Major include: MA 131, MA 132, MA 231, MA 232, plus 3 credits of Probability/Statistics from: MA 381, STAT 381, STAT 383, MA 381, etc.

At least 6 Communication Points (C-1/C-2 courses combined) are required. At least 2 Communication Points (two C-1 or one C-2) must be earned in Physics through courses at the 300- or 400-level (PH 327, PH 445-446).

All of these must be in one area outside of Physics; an area need not be a department. Concentration electives allow students to explore another field of interest outside physics. These classes, combined with free electives, can be used toward fulfilling the core course requirements for a double major.

At least one of the free electives should be a [C1] or [C2] designated Communication Intensive Course unless a [C1] course is already included in the Biology or Concentration electives.

* Some non-credit courses in Physical Education, Aerospace Studies and/or Military Science might be required for graduation.

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**Sample Physics Curriculum (Core Option)**

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<thead>
<tr>
<th>FIRST YEAR</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td><strong>Course</strong></td>
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<td>MA131</td>
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<td>Recommend PH157</td>
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<tr>
<td><strong>SOPHOMORE YEAR</strong></td>
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<tr>
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<td>PH231</td>
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<td>Information Tech. Elective</td>
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### JUNIOR YEAR

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<tr>
<td><strong>Course</strong></td>
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<tr>
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### SENIOR YEAR

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** Double Major Curricula should be planned in consultation with student’s academic advisors from both major fields.
BS in Political Science
Bill Vitek, Program Chair

Program Goals
Political Science investigates the institutions, practices, traditions, concepts and rules by means of which human beings organize their lives in common and govern themselves.

Courses in Political Science enable students to use empirical analyses and theoretical constructs to understand political aspects of their world, both in the United States and in other parts of the globe.

Students majoring in Political Science will acquire:
- A comprehensive understanding of politics, political institutions, and the processes involved in translating values and information into public policy and legislation.
- A critical grasp of the leading theories and disputes animating the various subfields of Political Science.
- An appreciation of the facets of citizenship needed to participate fully in political life.

Through their Political Science major at Clarkson, students will also gain the ability to:
- Write clearly and persuasively
- Speak effectively in a group setting
- Think critically
- Understand and analyze complex problems
- Examine and interpret evidence
- Organize and synthesize large amounts of information

Program Requirements*
120 credit hours, comprising:
- 1 credit Introduction to the Liberal Arts pre-seminar
- 8 courses in political science ideally including one each in
  - American Politics
  - Political Theory
  - International and Comparative Politics
  - Law and Public Policy
- The Humanities/Social Sciences Research Seminar
- 5 courses in a pre-professional external field
- Fulfillment of the requirements of the Clarkson Common Experience

Political Science majors will take POL 220, American Politics and a series of courses chosen in consultation with their advisors to develop a coherent program of study. Students have the opportunity to develop areas of expertise in American Politics, Public Policy, Political Theory or Environmental Politics.

Students majoring in Political Science are required to take at least five courses in a pre-professional external field, such as pre-law, pre-med, pre-physical therapy, business or communications and media. This concentration provides students with opportunities to increase career choices, while at the same time exploring a wide variety of interests through their major.

* Courses taken to fulfill requirements for a Humanities/Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social Sciences Minor.
Sample Curriculum

FRESHMAN YEAR

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SOPHOMORE YEAR

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JUNIOR YEAR

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BS in Psychology
Robert Dowman, Program Chair

Psychology is the study of mind and behavior. Its explorations span an enormous breadth, ranging from the activity of individual brain cells to the complex interactions between individuals and society. Psychology investigates how people develop and learn; how we perceive the world; how relationships are formed; how stress affects our health and impairs our performance; and why conflict is so much a part of the human experience. Psychologists also try to understand the nature and causes of abnormality and search for effective treatments to relieve the suffering it causes.

The Psychology program at Clarkson aims to provide each student with a solid foundation in the fundamental areas of psychology, as well as the opportunities to develop the problem solving, critical thinking, and communication skills that are critical in the workplace. We also strive to help students find interesting and rewarding careers related to psychology. To this end, each Psychology major is given lots hands-on learning opportunities. These include the directed research, where the student works closely with a faculty member on an experiment of mutual interest; clinical internships, where the student works with a therapist in a clinical environment; and industrial/organizational psychology internships where, the student works with psychologists in business settings.

Students graduating with a BS degree in psychology from Clarkson will:
- be able to critically evaluate information and apply it to a problem or question
- be able to apply psychological principles to real-world problems
- have content expertise in the areas of psychology represented by the psychology faculty
- be able to write clearly and effectively.

In addition to satisfying the Clarkson Common Experience, the BS in Psychology degree program requires:

REQUIRED PSYCHOLOGY COURSES
PY151 Introduction to Psychology
PY253 Social Psychology
PY255 Cognitive Psychology
PY456 Experimental Psychology
PY457 Experimental Psychology Laboratory
DIRECTED RESEARCH/INTERNSHIP REQUIREMENT (choose 1)
PY496 Directed Research
PY401-3 Internship
PHYSIOLOGICAL PSYCHOLOGY REQUIREMENT (choose 1)
PY454 Physiological Psychology
PY458 Cognitive Neuroscience
PY460 Neurobiology
COGNITIVE PSYCHOLOGY REQUIREMENT (choose 1)
PY357 Human Cognitive Evolution
PY358 Animal Learning and Cognition
PY359 Perception
PY360 Learning and Memory
PY461 Judgment and Decision Making
PY462 Abnormal Psychology
PSYCHOLOGY ELECTIVES (choose 3)
PY286 Organizational Behavior I
PY310 Human Sexuality
PY460 Neurobiology
PY315  Personal Relationships  PY463  Health Psychology
PY317  Psychology of Psychoactive Drugs  PY480  Directed Study in Psych.
PY319  Current Readings in Animal Behavior  PY481  Directed Study in Social Psych.
PY321  Consumer Behavior  PY482  Directed Study in Physiological Psych.
PY325  Group Dynamics  PY483  Directed Study in Cognitive Psych.
PY340  Behavioral Ecology and Sociobiology  PY491  Directed Research in Health Psych.
PY361  Motivation and Emotion  PY492  Directed Research in Psychophysiology
PY370  Developmental Psychology  PY494  Directed Research in Social Psych.
PY411  Counseling Psychology  PY498-499  Senior Thesis
PY412  Psychiatric Center Professional Exp
PY453  Advanced Topics in Social Psychology
PY459  Neuroscience Society

**MATHEMATICS:** 3 college level math courses to include at least one calculus course and one statistics course.

The Professional & Professional Experience and Information Technology requirements are distributed throughout the Psychology Curriculum. PY456 satisfies the Technology Serving Humanity requirement.

**Sample Curriculum**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PY151</td>
<td>Intro. to Psychology</td>
<td>3</td>
<td>PY255</td>
<td>Cognitive Psychology</td>
<td>3</td>
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<tr>
<td>UNIV190</td>
<td>Clarkson Seminar</td>
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<td>PY253</td>
<td>Social Psychology</td>
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<td></td>
<td>Mathematics Course</td>
<td>3</td>
<td></td>
<td>Mathematics Course</td>
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</tr>
<tr>
<td></td>
<td>Science Course</td>
<td>5</td>
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<td>Science Course</td>
<td>3</td>
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<tr>
<td>FY100</td>
<td>First-Year Seminar</td>
<td>1</td>
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<td>Science Course Lab</td>
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<td><strong>Total</strong></td>
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### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Course Title</strong></td>
</tr>
<tr>
<td>MA282</td>
<td>Statistics</td>
</tr>
<tr>
<td>Psychology Electives</td>
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<td>Free Elective</td>
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### JUNIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Course Title</strong></td>
</tr>
<tr>
<td>PY456/7</td>
<td>Experimental Psychology &amp; Lab</td>
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<tr>
<td>KA/UC</td>
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<tr>
<td>Free Electives</td>
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### SENIOR YEAR

<table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Course Title</strong></td>
</tr>
<tr>
<td>PY</td>
<td>Directed Research/Internship</td>
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<td></td>
<td>Internship</td>
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<td></td>
<td>KA/UC</td>
</tr>
<tr>
<td></td>
<td>Free Electives</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BS in Software Engineering

The discipline of software engineering is concerned with the application of engineering principles to the construction of computer software. It addresses critical issues across the life cycle of a software product, beginning with a proposal to develop an application that requires computing resources and continuing through the development, testing, operation, and maintenance of the software product until it is retired.

The software engineer plays the role of the architect of a complex system. He or she takes into account the user requirements and needs, feasibility, cost, quality, reliability, safety, and time constraints. To do this, the software engineer has to be able to understand the application area that is the target of the desired software system, develop the software and ensure that it is reliable, and also manage the project so that it is produced in an economical, timely manner.

Objectives of the Clarkson Software Engineering Program

Software engineering graduates should be well prepared for a lifetime of professional activity, and the objective of our program is to build a foundation on which graduates can build successful careers. This means that, within a few years after completing the program, we expect that our graduates will be contributing professionals, and effective and responsible collaborators. They should also have continued to grow intellectually and as well rounded citizens. This means graduates are expected to have

- Advanced their careers as contributing professionals who apply fundamental engineering knowledge and analytical problem solving skills in a wide variety of practical applications
- Become well-rounded citizens who rely on their engineering education to serve society in an ethical and professional manner
- Become effective and responsible collaborators who function well in diverse team environments, with some graduates having emerged as leaders in their field
- Have exhibited intellectual growth and pursued continual innovation in their field, while those graduates who are especially talented and motivated to pursue a graduate degree should be or have been successful at entering and completing graduate studies

To attain these objectives, the curriculum is structured so that when a student graduates from the Software Engineering program, he or she will have gained the knowledge, skills, and attributes that provide a foundation on which a successful career in the Software Engineering profession rests. Our graduates will attain the following student outcomes:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

In the context of the software engineering discipline, this means that graduates of the program will:
- have a fundamental understanding of computer systems
- be able to apply engineering principles to software design and construction, having developed the ability to:
  - develop software requirements and functional specifications
  - use proven techniques to design software structure before it is implemented
  - apply established verification and validation techniques
  - understand the importance of constructing large software systems using standardized components and reusing existing code (modules) where possible,
  - use software tools as effective aids in all phases of software development
  - design, develop, and deliver software in a cost effective manner
- have experience with issues encountered at every stage in the software life-cycle
- understand how to manage the development of software intensive systems
- be able to work on an interdisciplinary team of software components of a system
- have good interpersonal and communication skills
- be able to readily assimilate new technologies
- understand the impact their discipline has on society

**Curriculum**
To accomplish these goals, the curriculum is structured around a group of required courses in science, mathematics, and computer science and engineering. A variety of courses in the engineering sciences are included in the curriculum in order to provide exposure to application areas. Although there is ample opportunity for students to participate in team-based activities throughout the curriculum, each student’s program of study includes a major design experience in the senior year in which the student is required to bring together knowledge gained in a wide variety of courses to solve realistic problems, building significant applications in a team-based environment.

**An Interdisciplinary Approach**
Software Engineering is distinctive at Clarkson because it is interdisciplinary: we combine the expertise, knowledge, and experience of faculty from both the Electrical and Computer Engineering and the Computer Science Departments. That benefits the students because they master the application of theory as well as knowledge and understanding of processes software process as they gain the ability to develop effective and cost-efficient software systems. Clarkson’s program is also designed to help students build interpersonal and communication skills that can launch a successful career in today’s world.
Software Engineering Curriculum

FIRST YEAR
(See Common First-Year Curriculum in Engineering)

SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Cr. Hrs.</th>
<th>Course Title</th>
<th>Cr. Hrs.</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA232 Differential Equations</td>
<td>3</td>
<td>MA231 Calculus III</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MA211 Foundations</td>
<td>3</td>
<td>EE264 Intro. to Digital Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ES250 Electrical Science</td>
<td>3</td>
<td>EE361 Fundamentals of Software Engineering</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>EE261 Intro. to Programming and Software Design or</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS141 Computer Science I</td>
<td>4</td>
<td>EE221 Linear Circuits or</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>KA/UC Elective</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>15 or 16</td>
<td>KA/UC Elective</td>
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</table>

JUNIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Cr. Hrs.</th>
<th>Course Title</th>
<th>Cr. Hrs.</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>STAT383 Probability and Statistics or</td>
<td>3</td>
<td>CS344 Algorithms and Data Structures</td>
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<tr>
<td>MA381 Probability</td>
<td>3</td>
<td>EE360 Microprocessors</td>
<td>3</td>
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</tr>
<tr>
<td>EE407 Computer Networks</td>
<td>3</td>
<td>EE368 Software Engineering Architecture</td>
<td>3</td>
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</tr>
<tr>
<td>EE363 Generic Programming &amp; Software Components</td>
<td>3</td>
<td>EE462 Software System Architecture</td>
<td>3</td>
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</tr>
<tr>
<td>Software Design for Visual Environments</td>
<td>3</td>
<td>EE468 Database Systems</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>EE408 KA/UC Elective*</td>
<td>3</td>
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<td></td>
<td>12</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
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<tr>
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</tr>
<tr>
<td>EE418</td>
<td>Senior Design</td>
<td>3</td>
<td>CS444</td>
<td>Operating Systems</td>
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<tr>
<td>EE466</td>
<td>Computer Architecture</td>
<td>3</td>
<td>CS458</td>
<td>Formal Methods for</td>
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<tr>
<td>CS341</td>
<td>Programming Languages</td>
<td>3</td>
<td></td>
<td>Program Verification</td>
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<td></td>
<td>Professional Elective</td>
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<tr>
<td>KA/UC Elective</td>
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<td>Undesignated Electives</td>
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<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>Total</strong></td>
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</tbody>
</table>

* One of the KA/UC electives must be in economics.
Undergraduate Minors in Arts & Sciences

Minor in Biology
A minor in Biology is available to students who take at least 19 credit hours in Biology as follows:
Core Courses (9 credits): Students must take BY140 Biology I (3 cr.) and BY160 Biology II (3 cr.) and at least one of the following:

BY214  Genetics (3 cr.)
BY222  Ecology (3 cr.)
BY320  Microbiology (3 cr.)
BY360  Human Physiology (3 cr.)
BY471  Human Anatomy and Physiology I (3 cr.)
BY472  Human Anatomy and Physiology II (3 cr.)

Elective Courses (9 credits): Students must take at least 9 credits of Biology courses numbered 300 or above.
Laboratory Requirement (1-2 credits): Students must take at least one of the following laboratory courses:

BY224  Ecology Laboratory (2 cr.)
BY142  Biology II Laboratory (2 cr.)
BY162  Biology II Laboratory (2 cr.)
BY322  Microbiology Laboratory (2 cr.)
BY362  Human Physiology Laboratory (2 cr.)
BY473  Human Anatomy and Physiology I Laboratory (2 cr.)
BY474  Human Anatomy and Physiology II Laboratory (2 cr.)

*Students should consult with the Biology Chair to determine whether AP Biology will satisfy the BY140 and BY160 requirement.
Minor in Biomedical Engineering

Minor in Biomedical Science and Technology
As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minors in Biomedical Engineering and Biomedical Science and Technology enhance opportunities for Clarkson’s students to meet this need. Students can take only one (not both) of the two minors. See description under Undergraduate Interdisciplinary Minors in the Interdisciplinary Programs section of the Catalog.

Minor in Biology, Behavior, and Society (BiBS)
A diverse group of disciplines attempt to document and explain the origins and functions of human cognition, social behavior, and social organization: anthropology, biology, economics, history, psychology, and sociology each include a disciplinary focus on the origins and current consequences of individual and group behavior and social outcomes. However, among disciplines - and even within disciplines - there is disagreement about the relative importance of genes, natural environment, individual rational-choice, and sociocultural-construction on individual and group behavior, cultures, and social institutions. Historical views have ranged from strong biopsychological determinism, to environmental determinism & individual rational choice, to strong sociocultural determinism. Views on the origins and current functions of behavior, culture, and society can and often do affect social policy; extreme views have provided the intellectual rationale for eugenics, racism, sexism, imperialism, laissez-faire capitalism, and collectivization and ‘cultural revolution’. On a positive note, interdisciplinary progress at understanding the origins and functions of human behavior and human cultures & societies has contributed to progressive reforms in the areas of mental health, public health, laws and criminal justice, education, intercultural understanding, and programs to provide economic and social opportunity for the underprivileged.

Views on questions of ‘human nature’ have tended to become polarized between the ‘biological’ (biology, evolutionary psychology, biological anthropology) and the ‘social science’ (social psychology, cultural anthropology, history, sociology) poles. This dialectical relationship between the social and biological sciences and the corresponding dialogue between both, forces both sides in this rich debate to refine their positions and expose students to a deeper understanding of the foundations of the respective disciplines and their impact on the world. Our minor in Biology, Behavior, and Society (BiBS) will expose students to these diverse disciplinary traditions and their conflicts and debates in the present and past. This minor provides students the knowledge and skills to become informed, critical, and reflective citizens that can make balanced decisions about the imbricate relationship of biology, psychology, culture and society.

The BiBS minor is intended for students who want to acquire an interdisciplinary and comprehensive overview of the different perspectives on human behavior, human cultural evolution, and human social organization. The objective of this minor is for students to understand the theoretical and empirical foundations of multiple disciplines that contribute to understanding human behavior and be able to knowledgeably weigh the perspectives of each. An aspirational outcome is that students can develop a synthetic, informed understanding of the origins and function of human behavior, cultures, and societies. We believe that this minor will attract students who are interested in biology, psychology, social sciences, health careers, law, politics, and economics and provide them with bio-cultural literacy critical to evaluating the multiplicity of scientific claims about ‘human nature’.
The four core course requirements within this degree program provide the interdisciplinary foundation of psychology, biology, and social science. The three additional electives will provide a student with depth in specific areas while continuing to confront an interdisciplinary set of perspectives.

REQUIREMENTS FOR THE BIOLOGY, BEHAVIOR, AND SOCIETY MINOR
A minor in Biology, Behavior, and Society is available to students in all degree programs. To obtain a minor, students must complete 20 credits:

Required courses (11 credits):
HIST270 Introduction to Culture, Society & Biology (3 credit) [CSO/STS, C1]
BY/PY340 Behavioral Ecology and Sociobiology (3 credit) [IG]
BY/PY357 Human Cognitive Evolution (3 credit)
SA&S300 Arts and Sciences Seminar (1 credit)
SA&S499 Biology, Behavior and Society Minor Portfolio (new course, 1 credit)

A student, to complete the minor, will take SAS499 as an independent study course under the mentorship of the student’s minor advisor. The student will provide a portfolio based on (a) term papers or equivalent products from the three major required courses, (b) representative course material that shows mastery of subject matter area, and (c) will use the portfolio and materials from other courses taken for the BiBS minor to prepare a 10 page self-reflective essay on what the student has learned about the biological, psychological, and socio-cultural influences on human behavior, human cultural evolution, and human social organization.

Electives (9 credits): Electives must be from outside your declared major, and include at least three credits from each of the two categories:

**Category 1 Electives**
- ANTH220: Understanding the Americas [UNIV/CSO/STS, C1]
- ANTH225: Global Perspectives on Sexuality [UNIV/CGI/STS]
- ANTH230 Introduction to Race and Ethnicity [UNIV/CGI/CGI]
- ANTH270 Environment, Technology and Society [STS]
- ANTH325: Sex and Commerce [UNIV/IG/CGI, C2]
- ANTH330: Men and Masculinities [CSO]
- HIST320: Medicine and Society in America [UNIV/CSO/STS, C1]
- HIST326: Modern Sex [UNIV/CSO/STS]
- HIST327: History of Women and Gender in America [UNIV/CSO/IG, C1]
- HIST328: History of Gender and Sex [UNIV/CSO/IG]
- HIST329: History of the American Family [UNIV/CGI/CSO, C1]
- HIST342: War and Gender [UNIV/CSO/IA, C1]
- HIST350: History of Nazi Germany [UNIV/CSO/IG, C1]
- HIST351: History of the Holocaust
- SOC330: Health, Wealth, Inequality and the Environment [UNIV/CGI/STS, C1]
- POL/SOC350: International Development and Social Change [EC]
- SOC385: Food and Society [UNIV/CGI/STS]
- SS220 Introduction to Gender [UNIV/CGI/IG]
**Category 2 Electives**
- BY/PY319 Current Readings in Animal Behavior
- BY/PY358 Animal Learning and Cognition
- BY 460 Neurobiology
- BY420 Evolution
- EC384 Game Theory and Economic Strategy
- HIST/PY459 Neuroscience and Society [STS, C1]
- OS286/PY286 Organizational Behavior 1 [IG]
- PY253 Social Psychology
- PY310 Human Sexuality [UNIV/CGI/IG]
- PY315 Personal Relationships [C1]
- PY453 Advanced Topics in Social Psychology [C2]
- PY360 Learning and Memory
- PY461 Judgment and Decision Making
- PY463 Health Psychology [C1]

**Minor in Chemistry**
Students pursuing the minor in Chemistry must complete the following requirements. The minor is not open to students majoring in Chemistry or Biomolecular Science.

First Year – Prerequisites:

- CM103, CM104, CM105 and CM106  
  10 credits
- or
- CM131 and CM132  
  8 credits

Students must take five of the following 14 courses, including at least one of the labs:

- CM221 Spectroscopy
- CM223 Spectroscopy Lab
- CM241 Organic Chemistry I
- CM242 Organic Chemistry II
- CM244 Organic Chemistry Lab
- CM300 Instrumental Lab
- CM312 Introduction to Inorganic Chemistry
- CM320 Separations and Electrochemistry
- CM345 Advanced Lab
- CM371 Physical Chemistry I
- CM372 Physical Chemistry II
- CM460 Biochemistry I
- CM461 Biochemistry II
- CM470 Biochemistry/Biotechnology Lab  
  15 credits

**Total Chemistry Credits**  
23 or 25
Minor in Cognitive Neuroscience

Required Basic Science Courses (29 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PY151</td>
<td>Introduction to Psychology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY140</td>
<td>Biology I: Inheritance, Evolution and Diversity</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY142</td>
<td>Biology I Laboratory</td>
<td>2 cr.</td>
</tr>
<tr>
<td>BY160</td>
<td>Biology II: Cellular and Molecular Biology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>CM131</td>
<td>General Chemistry I</td>
<td>4 cr.</td>
</tr>
<tr>
<td>CM132</td>
<td>General Chemistry II</td>
<td>4 cr.</td>
</tr>
<tr>
<td>PH141</td>
<td>Physics for Life Sciences I</td>
<td>4 cr.</td>
</tr>
<tr>
<td>PH142</td>
<td>Physics for Life Sciences II</td>
<td>4 cr.</td>
</tr>
</tbody>
</table>

Required Cognitive Neuroscience Courses (9 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BY/PY458</td>
<td>Cognitive Neuroscience</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY/PY454</td>
<td>Physiological Psychology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY/PY460</td>
<td>Neurobiology</td>
<td>3 cr.</td>
</tr>
</tbody>
</table>

Elective Psychology Courses: 2 courses (6 credits) chosen from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PY317</td>
<td>Psychology of Psychoactive Drugs</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY/PY358</td>
<td>Animal Learning and Cognition</td>
<td>3 cr.</td>
</tr>
<tr>
<td>PY359</td>
<td>Perception</td>
<td>3 cr.</td>
</tr>
<tr>
<td>PY360</td>
<td>Learning and Memory</td>
<td>3 cr.</td>
</tr>
<tr>
<td>PY462</td>
<td>Abnormal Psychology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>PY463</td>
<td>Health Psychology</td>
<td>3 cr.</td>
</tr>
</tbody>
</table>

Elective Biology Courses: 2 courses (6 credits) chosen from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY360</td>
<td>Physiology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY312</td>
<td>Cell Biology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY214</td>
<td>Genetics</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY310</td>
<td>Developmental Biology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY350</td>
<td>Comparative Anatomy</td>
<td>3 cr.</td>
</tr>
<tr>
<td>BY471</td>
<td>Anatomy and Physiology I</td>
<td></td>
</tr>
<tr>
<td>BY472</td>
<td>Anatomy and Physiology II</td>
<td></td>
</tr>
</tbody>
</table>

1CM103/105 and CM104/106 will also satisfy the Chemistry requirement.
2PH131 and PH132 will also satisfy the Physics requirement.
3Biology majors taking the cognitive neuroscience minor cannot use PY/BY454 as one of their Biology elective courses.

Minor in Communication

Clarkson University offers a minor in Communication that is available to all undergraduate students with the exception of Communication majors. Courses used to fulfill the requirements of the minor include writing, speaking, graphic design, and theory. To achieve a minor in Communication, students must achieve a 2.0 grade average in six three-credit courses, distributed in the following fashion:

Students must take one course from each of the four groups below, plus any other two communication courses:
<table>
<thead>
<tr>
<th>Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM210  Theory of Rhetoric for Business, Science and Engineering</td>
</tr>
<tr>
<td>COMM226  Short Film Writing</td>
</tr>
<tr>
<td>COMM312  Public Relations</td>
</tr>
<tr>
<td>COMM313* Professional Communication</td>
</tr>
<tr>
<td>COMM 326 Feature Film Screenwriting</td>
</tr>
<tr>
<td>COMM330  Science Journalism</td>
</tr>
<tr>
<td>COMM428* Environmental Communication</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM217  Introduction to Public Speaking</td>
</tr>
<tr>
<td>COMM312  Public Relations</td>
</tr>
<tr>
<td>COMM313* Professional Communication</td>
</tr>
<tr>
<td>COMM417  Business and Professional Speaking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM100  2D Digital Design</td>
</tr>
<tr>
<td>COMM320  Digital Photography</td>
</tr>
<tr>
<td>COMM322  Typography and Design</td>
</tr>
<tr>
<td>COMM327  Digital Video Production I</td>
</tr>
<tr>
<td>COMM341  Introduction to Web Design</td>
</tr>
<tr>
<td>COMM345  Information Design</td>
</tr>
<tr>
<td>COMM360  Audio Production</td>
</tr>
<tr>
<td>COMM409  Introduction to Instructional Design</td>
</tr>
<tr>
<td>COMM427  Digital Video Production II</td>
</tr>
<tr>
<td>COMM440  PHP/My SQL Interactive Design</td>
</tr>
<tr>
<td>COMM441  JavaScript Interactive Design</td>
</tr>
<tr>
<td>COMM442  Advanced World Wide Web Interface Design</td>
</tr>
<tr>
<td>COMM444  Linux Web System Administration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM310  Mass Media and Society</td>
</tr>
<tr>
<td>COMM410  Theory and Philosophy of Communication</td>
</tr>
<tr>
<td>COMM412  Organizational Communications and Public Relations Theory</td>
</tr>
<tr>
<td>COMM428* Environmental Communication</td>
</tr>
</tbody>
</table>

*Course may be used for one of two groups but not both.

**NOTE:** Students may transfer no more than six off-campus credits towards the minor. The chair of the Department of Communication & Media must approve transfer courses.
**Minor in Computational Science**
The minor in Computational Science and Engineering (CSE), is available to students in any major. The minor allows students to develop an expertise in CSE while pursuing a conventional major, which provides the context wherein they apply their computational skills. The requirements are:

MA377 Numerical Methods

**At least two of:**

MA232 Differential Equations
MA239/339 Elementary/Applied Linear Algebra
STAT282/383 Probability and Statistics

Plus application area electives to make a total of 21 credits. Application area electives are computational courses in departments other than Mathematics, typically drawn from the student's major. The current list of approved courses is maintained by the Mathematics Department.

**Minor in Computer Science**
A minor in Computer Science is available to all students except those majoring in Computer Science or Software Engineering.

1. Core courses:
   - CS141 Introduction to Computer Science I
   - CS142 Introduction to Computer Science II
   - MA211 Foundations
   - CS344 Algorithms and Data Structures

2. Electives:
   Three additional CS courses, one numbered 200 or higher, one numbered 300 or higher, and one numbered 400 or higher. Each course must be worth at least three credits. Certain courses cannot be used for the minor and some substitutions are acceptable. Contact the Department of Computer Science for details.

Exclusion: The Minor in Computer Science is not open to students majoring in Computer Science or Software Engineering.

**Minor in Gender & Sexuality Studies**
All students choosing a minor in Gender and Sexuality Studies must complete 15 credit hours (five courses) and satisfy the following requirements:

1. Either SS 220, Introduction to Gender, or SS 221, Introduction to Sexuality

2. Four of the following Gender and Sexuality Studies courses:

As of July 2015, the list of approved Gender and Sexuality Studies courses includes:
   - Either SS 220 or SS 221 (whichever one was not taken to satisfy requirement #1)
   - ANTH 225 Global Perspectives on Sexuality
ANTH 325 Sex and Commerce
ANTH 330 Men & Masculinities
HIST 326 Modern Sex: Sexualities and Genders in Modern America
HIST 327 History of Women and Gender in America
HIST 328 History of Gender and Sexuality in the Transatlantic World
HIST 329 History of the American Family
HIST 338 Women, Gender, and Science in American History
HIST 342 War and Gender: The Modern Period
LIT 240 Gender and Popular Culture
POL 355 Women and Politics
SOC 310 Women and Religion
SOC 330 Health, Wealth, Inequality, and the Environment

3. SS 499 Zero-credit Minor Portfolio, as required of the other minors in the Department of Humanities and Social Sciences.

Advising for the minor takes place in the Department of Humanities and Social Sciences.

**Minors in Humanities and Social Sciences***

The Department of Humanities and Social Sciences offers minors that consist of a coherent set of five courses beyond the Clarkson Seminar, plus completion of a Minor Portfolio. There are three different types of minor: Thematic Minors, Disciplinary Minors, and Student-Designed Minors.

**Thematic Minors.** These interdisciplinary minors consist of five related humanities and social sciences courses that address a common theme. The currently available thematic minors are:

1. International and Cross-Cultural Perspectives
2. Literature and the Arts
3. Science, Technology and Society
4. War Studies

**Disciplinary Minors.** These minors consist of five courses in one of the disciplinary areas in the Department of Humanities and Social Sciences, for example, Anthropology, History, Sociology, Literature, Philosophy, and Political Science. A list of disciplinary areas, as well as other information about these minors, is available from the Department of Humanities and Social Sciences.

**Student Designed Minors.** Students propose these minors through the office of the Department of Humanities and Social Sciences to a faculty committee for approval. The proposal lists the courses that a student will take for his or her minor and articulates the coherence among the courses. Students are encouraged to design their minor in collaboration with a faculty advisor in the Department of Humanities and Social Sciences. Guidelines for developing and submitting a proposal for a student-designed minor are available from the department office.
**Minors Portfolio.** Under the guidance of a faculty advisor in the Department of Humanities and Social Sciences, a student completing one of the above minors will compile a portfolio that represents his or her learning experience in the minor. The portfolio will be completed within the appropriately designated 499, “Humanities/Social Sciences Minor Portfolio,” a zero-credit hour course under the direction of the student’s minor advisor in the department. A student must receive a P in the minor portfolio in order to complete the requirements for the minor. Additional information about the Minors Portfolio is available from the Department of Humanities and Social Sciences office, Snell 265.

* Courses taken to fulfill requirements for a Humanities/Social Science Minor cannot be used to fulfill requirements for a Humanities and Social Science Major.

**Minor in Information Technology**

A minor in Information Technology is available to students in any degree program. The requirements are 21 credits consisting of:

1. two courses in problem solving and programming: CS141 or EE261, and CS142 or EE361
2. one course in computer systems: CS241 or EE360
3. one course in database administration: IS314*
4. one course in computer networks: EE407/CS455
5. two courses concerned with Web technologies and administration: COMM442 and COMM444

* For School of Business Majors for whom IS314 is not a required course, IS211 may be used to fulfill this requirement.

**Minor in Mathematics**

A minor in Mathematics is available to a student who achieves a 2.0 grade-point average in seven three-credit courses from the following list:

- MA131  Calculus I
- MA132  Calculus II
- MA200  Introduction to Math Modeling & Software
- MA211  Foundations
- MA230  3-D Space and Projective Geometry
- MA231  Calculus III
- MA232  Elementary Differential Equations
- MA239  Elementary Linear Algebra
- MA131  Calculus I
- MA132  Calculus II
- MA211  Foundations
- MA230  3-D Space and Projective Geometry
MA231  Calculus III
MA232  Elementary Differential Equations
MA239  Elem. Linear Algebra
Any three-credit courses numbered MA/STAT300 or above.

Minor in Physics
A minor in Physics is available to students in any degree program. To obtain a minor, a student must complete the following courses:

PH131  Physics I (4 cr.)
PH132  Physics II (4 cr.)
PH231  Fundamentals of Modern Physics (3 cr.)
PH221  Theoretical Mechanics (3 cr.)
PH331  Quantum Physics I (3 cr.)

One of the following basic courses
PH121  Physics Freshman Seminar
PH232  Modern Physics Laboratory

Any two 3-credit Physics or equivalent courses
Approved by the department at the 300-400 level (6 credits).

Minor in Psychology
A minor in Psychology is available to students in any degree program, except Psychology. To obtain a minor in Psychology, a student must complete six courses, PY151 Introduction to Psychology and five PY courses selected from PY255, PY253, or any PY course numbered 300 or above, only one of which can be a directed research or internship.

Minor in Software Engineering
A minor in Software Engineering is available to students in any degree program with the exception of the Software Engineering and Computer Science degree programs. To obtain a minor, a student must complete the following course requirements:

a. (CS141, CS142, and CS344) or (EE261, EE361, and EE363)
b. CS242 or EE408
c. EE368 or CS350
d. EE465/CS452, CS455/EE407, EE468/CS460, or other course approved by the Software Engineering Program Committee.

Minor in Statistics
A minor in Statistics is available to students in almost all degree programs. The requirements are:
At least 21 credits, distributed as follows.

1. One calculus course (MA181 or MA131 or equivalent)
2. One linear algebra course (MA239 or MA339 or equivalent)
3. One introductory statistics course (STAT282 or STAT383 or equivalent)
4. A total of at least 12 additional credits from statistics courses or projects including at least two statistics courses, or projects, from departments other than Mathematics. The current list of approved courses is maintained by the Mathematics Department.

Exclusion: Applied Mathematics and Statistics majors, and majors in Mathematics (Statistics option) are excluded from this minor.

SCHOOL OF BUSINESS
Dayle Smith, Dean; Mark R. Frascatore, Associate Dean of Undergraduate Business Programs,

The Clarkson University School of Business provides a valuable and interesting array of educational opportunities for students interested in careers that are aligned with the challenges and opportunities that face the business leaders of today. Managing innovation, the supply chain, customers, and flows of information and financial capital across global boundaries requires a set of knowledge and skills that become ingrained in our students. The proof is in the employment statistics of our graduates, who enjoy placement rates, starting salaries, and career mobility and flexibility that are among the best in the nation.

The mission of the Clarkson University School of Business is to work together to create and advance knowledge at the intersection of business and technology. We educate and develop students who span disciplinary boundaries, seek innovative solutions through creative problem solving, and lead in a global environment.

In an effort to achieve this mission, the School of Business has built a world-class faculty, and created a curriculum that requires hands-on learning, ample opportunities to develop leadership skills and build professional networks inside and outside the classroom. The School of Business has fostered an innovative and supportive culture where students and faculty enjoy working hard and seeing results. We focus our resources on two areas that span the traditional functional boundaries: Global Supply Chain Management and Innovation & Entrepreneurship. Our curriculum has room for you to develop expertise in all of the traditional business disciplines: finance, accounting, marketing, management, operations and information systems, but we also allow you to clearly see how those business functions fit together in the real world, and help you create a balance of functional expertise with an understanding of the "big picture"; that is how the functional parts of organizations must work together to create value and wealth. This combination of detail-oriented expertise with a broad system-wide perspective is something that our employers helped us create. Our approach has proven to be effective and beneficial to employers and has helped us to earn national rankings in both supply chain management and entrepreneurship.

Our secret to implementing all of these ideas is simple to explain, but difficult for most schools to imitate. We offer an innovative first-year program for undergraduates where students innovate and then plan and run a real business; we offer multiple opportunities for hands-on learning; we help you build a professional network; we offer an integrated, technology-infused curriculum; and we start all of this early, at the beginning of your Clarkson experience. The result is a connected, knowledgeable graduate prepared for success in the business world and in the community. We can do this, and do it well, because of a combination of our size, our faculty, our alumni, our location and our heritage.
The strength of our curriculum is driven by the quality of our faculty. Faculty use active learning approaches to bring the curriculum to life. Small-group discussions, real-life case studies, field projects, student consulting teams and simulation exercises are examples of the teaching methods woven into courses. These experiences help develop students who can lead, be an effective team member, and work well with customers, suppliers, colleagues and the community. Written, oral and technological communication skills are integrated across the curriculum. Frequent visits by executives and managers link the classroom to the business world. To extend and broaden learning and development beyond the classroom, all School of Business students are required to have an international experience (either a traditional semester abroad or a short two to three week faculty-led trip) and a professional experience in the nature of an internship or a work co-op. Additionally, all students are encouraged to participate in campus organizations and professional societies. Strong programs in engineering and science provide special opportunities for students who wish to combine management and technical interests.

Our undergraduate and graduate programs of the School of Business are accredited by AACSB, the most prestigious national accrediting body for business programs. Fewer than 25 percent of the nation’s business programs share this distinction, which is based on an institution’s ability to deliver a comprehensive and unique business-related educational experience to its students.

FACULTY

Consumer and Organizational Studies
Professors Larry Compeau, Augustine A. Lado, Rajesh Sethi; Associate Professor Stephen Sauer, Sandra Fisher, Michael Wasserman; Assistant Professors Floyd Ormsbee, Na-Eun Cho, Zhaleh Semnani-Azad, Anju Sethi, Marc Compeau

Economics and Financial Studies
Professors Clifford Brown, Mark R. Frascatore; Associate Professors, Luciana Echazu, Martin Heintzelman, Diego Nocetti, Alasdair Turnbull, Allan Zebedee; Assistant Professors, Bebonchu Atems, Gilberto Marquez-Illescas, Mohamed Mekhaimer, Jose Vega, Lining Zhou, Joseph Andriano, Instructors Gasper Sekelj

Engineering & Management
Professor Amy Zander; Assistant Professor Muhammad Usman Ahmed, H. Cecilia Martinez Leon, Seyedamirabbas Mousavian, R. John Milne, Marshall Issen

Operations and Information Systems
Professors Boris Jukic, Farzad Mahmoudi, Weiling Ke; Associate Professors Santosh Mahapatra, Somendra Pant, Dennis Yu; Assistant Professors William MacKinnon, Chester Xiang; Instructors Jesse Sherman

Undergraduate Business Programs

Common First- & Second-Year Curricula
The program’s first two years are designed to provide flexibility so students are exposed to a variety of courses. Students will have formal and informal opportunities to learn about the majors, minors and career opportunities so that a student can make a good decision about choosing an academic path in which he or she is interested. With the exception of Engineering and Management, courses students take are virtually
identical for all School of Business students during those first two years, so they need not declare a major until the sophomore year. Freshmen who enroll as undecided business majors are considered to be fully matriculated in the School of Business. Within the first two years, students will select a specific program of interest.

We have undergraduate integrated majors that result in the Bachelor of Science degree:

- Global Supply Chain Management
- Innovation & Entrepreneurship
- Financial Information & Analysis
- Information Systems & Business Processes
- Engineering & Management

We also offer a range of minors including Economics, Law Studies, Human Resource Management and Project Management. These are explained below. All Bachelor of Science degree candidates must successfully complete the Clarkson Common Experience, all requirements of their major and 120 credits. Additionally, all Bachelor of Science degree candidates must complete an international educational experience and an internship.

The Common First- and Second-Year Curriculum
(non-Engineering and Management majors)

<table>
<thead>
<tr>
<th>First Year — First Semester</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>First Year — Second Semester</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC150</td>
<td>Principles of Microeconomics</td>
<td>3</td>
<td>EC151</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB113</td>
<td>Entrepreneurship and Business Innovation I*</td>
<td>3</td>
<td>SB114</td>
<td>Entrepreneurship and Business Innovation II*</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIV190</td>
<td>Clarkson Seminar</td>
<td>3</td>
<td>Science Course</td>
<td>Area requirement</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA180</td>
<td>Intro to College Math or Non-Business Elective **</td>
<td>4/3</td>
<td>MA181</td>
<td>Basic Calculus **</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>16/17</td>
<td></td>
<td>TOTAL</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Second Year — First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS211</td>
<td>Introduction to ERP</td>
<td>3</td>
<td>OS286</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>AC205</td>
<td>Accounting for Decision Analysis</td>
<td>3</td>
<td>MK320</td>
<td>Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>LW270</td>
<td>Law and Society I</td>
<td>3</td>
<td>OM331</td>
<td>Operations and Supply</td>
<td>3</td>
</tr>
<tr>
<td>PHIL243</td>
<td>Business Ethics (recommended or)</td>
<td>EC311</td>
<td>Introduction to Econometrics</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
other non-business elective) 3
STAT282 Statistics 3
TOTAL 15

Non-Business Elective
to satisfy Clarkson
Common Experience
Knowledge Area requirement or
Intro. to Programming and Application Development
Science I*** 3
TOTAL 15

*Transfer students are required to take upper-level School of Business electives in place of SB113/SB114.
** Students must complete a basic calculus course. MA131 can be substituted for MA181.
*** Students wishing to major in Information Systems and Business Processes should take IS237 Introduction to Programming and Application Development in the sophomore year, or CS141 Introduction to Computer Science (4 credits) or EE261 Introduction to Programming and Software Design.
BS in Global Supply Chain Management (GSCM)

The principles behind supply chain management focus on developing seamless flows of raw materials, products/services, information and financial capital. The supply chain starts at the initial design process and includes raw material sourcing, logistics and continues through the delivery of that product or service to the end customer, with a goal of creating customer satisfaction at optimal cost. The GSCM curriculum takes a systems approach, which includes concepts and faculty from operations management, marketing, information systems, human resource management, strategic management and economics woven together in a seamless curriculum. Concepts emphasized include:

- Integration through ERP (Enterprise Resource Planning)
- A process management approach to quality
- A global orientation
- E-commerce based strategies
- Employing IT as a decision-making tool
- People and organizational skills for implementing GSCM solutions
- Incorporating environmental sustainability perspectives

Students earning a degree in Global Supply Chain Management must complete the Clarkson Common Experience and complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses (calculus and statistics), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business courses to satisfy the major requirements; and 18 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most electives, depending on courses chosen to fulfill the requirements of the Clarkson Common Experience, will be non-business courses taken in other schools at Clarkson University.

Required courses include:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC451</td>
<td>Industrial &amp; Supply Chain Economics</td>
</tr>
<tr>
<td>IS428</td>
<td>Information Systems for Supply Chain Management</td>
</tr>
<tr>
<td>SB361</td>
<td>Supply Chain Environmental Management</td>
</tr>
<tr>
<td>SB441</td>
<td>Advanced Topics in Global Supply Chain Management</td>
</tr>
<tr>
<td>OS466</td>
<td>Negotiations &amp; Relationship Management</td>
</tr>
<tr>
<td>OM341</td>
<td>Global Sourcing &amp; Supply Chain Design</td>
</tr>
<tr>
<td>OM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
</tr>
</tbody>
</table>

Students choose one professional elective from the following list:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS314</td>
<td>Database Management</td>
</tr>
<tr>
<td>LW471</td>
<td>Law &amp; Society II</td>
</tr>
<tr>
<td>MK332</td>
<td>Marketing Research</td>
</tr>
<tr>
<td>MK431</td>
<td>Supply Chain Distribution Channels</td>
</tr>
<tr>
<td>MK437</td>
<td>Retail Marketing</td>
</tr>
<tr>
<td>MK436</td>
<td>Creativity, Innovation &amp; New Product Development</td>
</tr>
<tr>
<td>MK476</td>
<td>Management of Technology</td>
</tr>
<tr>
<td>SB305</td>
<td>Cost Management</td>
</tr>
<tr>
<td>SB305</td>
<td>Cost Management</td>
</tr>
</tbody>
</table>
The following would be the typical Third- and Fourth-Year Plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements.

### JUNIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>OM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
</tr>
<tr>
<td>OS352</td>
<td>Strategic Human Resource Management</td>
</tr>
<tr>
<td>FN361</td>
<td>Financial Management I</td>
</tr>
<tr>
<td></td>
<td>Free or Non-Business Elective</td>
</tr>
<tr>
<td></td>
<td>Non-Business Elective: Clarkson Common Experience Knowledge Area Requirement</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
</tr>
</tbody>
</table>

### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS466</td>
<td>Negotiations &amp; Relationship Management</td>
<td>3</td>
<td>SB441</td>
<td>Advanced Topics in Global Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>SB381</td>
<td>Logistics Management Channels</td>
<td>3</td>
<td>EC451</td>
<td>Industrial and Supply Chain Economics</td>
<td>3</td>
</tr>
<tr>
<td>OS432</td>
<td>Organizational Policy and Strategy</td>
<td>3</td>
<td>SB361</td>
<td>Supply Chain Environmental Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Non-Business Elective: Clarkson Common Experience</td>
<td></td>
<td></td>
<td>Non-Business Elective: Clarkson Common Experience Knowledge</td>
<td></td>
</tr>
</tbody>
</table>
BS in Engineering & Management  
Amy K. Zander, Program Director  
Misty Spriggs, Associate Director  

Clarkson’s Engineering & Management (E&M) program is ideal for those who desire breadth and flexibility in a career centered on leadership and technology. The major was established in 1954 to meet the growing needs of industry for individuals with strong skill sets in both engineering and business. Graduates are prepared to integrate the rapidly changing technical and managerial aspects of an organization.

The E&M program utilizes Clarkson’s traditional strengths, stressing engineering principles and technical problem solving in conjunction with quantitative and qualitative managerial decision making. Students receive a balanced education involving course requirements from each of the major disciplines of engineering, business, science and liberal arts. The carefully planned curriculum is taught by faculty within their respective areas of expertise.

The Program Educational Objectives of the E&M program are to prepare students who within a few years of graduation:

- Apply technical problem solving skills to develop innovative, effective, and sustainable solutions to complex problems;
- Lead multi-disciplinary teams to success by managing team dynamics;
- Effectively communicate information for decision-making both orally and in writing to both technical and non-technical audiences;
- Continuously balance simultaneous demands of today’s global environment through multi-tasking capabilities of planning, organizing, managing and controlling resources;
- Combine engineering and business core knowledge and apply quantitative and qualitative methods to process analysis in business systems;
- Make timely, ethical and useful decisions in response to organizational challenges.

Typically, E&M students are people oriented, at ease with science and mathematics, and anticipate increasing managerial responsibilities over the course of their careers. Problem solving, communication and teamwork permeate the E&M curriculum. By design, the environment is one of collaborative teamwork and is known for strong mutual support among students. E&M graduates are recognized as leaders and facilitators who possess the ability to initiate new ideas and change.

The E&M program maintains two professional organizations and an E&M Student Advisory Council. Sigma Tau Iota, the E&M honorary society, consists of students enrolled in the program who display consistent academic excellence. The Engineering & Management Society regularly hosts business leaders and representatives who engage students in discussions that range from career opportunities to current
industry trends and issues. The Student Advisory Council serves as a curricular advisory group and aids in assessment of the program outcomes.

Curriculum
The Engineering & Management program confers the Bachelor of Science (BS) degree upon completion of the 120 credit-hour program requirements. A candidate for the bachelor’s degree must not only pass all prescribed courses in the E&M curriculum, but must also meet all other graduation requirements and Clarkson Common Experience requirements stated in the Academic Requirements section of this catalog.

The Engineering & Management student is encouraged to use program professional electives to focus on specific career objectives. Students work closely with their advisor to select electives that best suit these objectives. Students often choose to pursue a minor in project management, a concentration in Global Supply Chain Management, or courses in Construction Management or Manufacturing Management.

Employment
Due to the program’s unique nature, and the quality and versatility of students attracted to it, E&M graduates are some of the most heavily recruited at Clarkson. For example, while the program’s enrollment represents roughly 10 percent of the student population, E&M seniors are typically invited to interview with nearly half of all companies recruiting at the on-campus Career Fair.

The career paths of E&M alumni reflect the breadth of the program’s curriculum and include:

Supply Chain Management  Consulting  Manufacturing and Production  Project Management  Marketing and Technical Sales
Quality Systems Management  Entrepreneurship  Applications Engineering  Field Service Engineering  Construction Management

Engineering & Management Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM205</td>
<td>Accounting for Decision Analysis</td>
<td>3</td>
<td>EM211</td>
<td>Intro to Enterprise</td>
<td>3</td>
</tr>
<tr>
<td>EM120</td>
<td>Team-Based Design &amp; Innovation\textsuperscript{1,3}</td>
<td>3</td>
<td>EM121</td>
<td>Technological Entrepreneurship\textsuperscript{1,3}</td>
<td>2</td>
</tr>
<tr>
<td>UNIV190</td>
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<td>PY151</td>
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<tr>
<td>MA131</td>
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<tr>
<td>CM131</td>
<td>Chemistry I</td>
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<td>CM132</td>
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</table>
**SOPHOMORE YEAR**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EC350</td>
<td>Economic Principles &amp; Engineering</td>
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<tr>
<td>LW270</td>
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<tr>
<td>MA232</td>
<td>Differential Equations</td>
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<tr>
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<tr>
<td>PH131</td>
<td>Physics I</td>
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<tr>
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<tr>
<td>STAT383</td>
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<td>PH132</td>
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**Second Semester**

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<tbody>
<tr>
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<td>3</td>
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<tr>
<td>EM333</td>
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<tr>
<td>MK320</td>
<td>Principles of Marketing</td>
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<tr>
<td>MA231</td>
<td>Calculus III</td>
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<tr>
<td>ES260</td>
<td>Materials Science or Professional Elective</td>
<td>3</td>
</tr>
<tr>
<td>ES222</td>
<td>Strength of Materials or</td>
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</tr>
<tr>
<td>EE264</td>
<td>Digital Design¹</td>
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- **Total:** 19

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**JUNIOR YEAR**

**First Semester**

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<td>EM333</td>
<td>Operations Research</td>
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<tr>
<td>MK320</td>
<td>Principles of Marketing</td>
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<tr>
<td>MA231</td>
<td>Calculus III</td>
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<tr>
<td>ES260</td>
<td>Materials Science or</td>
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<tr>
<td>ES222</td>
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</tr>
<tr>
<td>EE264</td>
<td>Digital Design¹</td>
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<tr>
<td>FN361</td>
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<td>3</td>
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<tr>
<td>EM331</td>
<td>Operations &amp; Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
</tr>
<tr>
<td>EM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
<td>3</td>
</tr>
<tr>
<td>EM331</td>
<td>Operations &amp; Supply Chain Management</td>
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<td>Electrical Science</td>
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<tr>
<td>EM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
<td>3</td>
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<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
</tr>
<tr>
<td>EM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
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<td>EM331</td>
<td>Operations &amp; Supply Chain Management</td>
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<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
</tr>
<tr>
<td>EM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
<td>3</td>
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<tr>
<td>ES250</td>
<td>Electrical Science</td>
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**Second Semester**

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<tr>
<td>EM432</td>
<td>Organizational Policy &amp; Strategy¹</td>
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<tr>
<td>EM425</td>
<td>Process Engineering &amp; Design¹</td>
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- **Total:** 15

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**SENIOR YEAR**

**First Semester**

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<tbody>
<tr>
<td>ES340</td>
<td>Thermodynamics</td>
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</tr>
<tr>
<td>EM432</td>
<td>Organizational Policy &amp; Strategy¹</td>
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<tr>
<td>Knowledge Area</td>
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<table>
<thead>
<tr>
<th>Course</th>
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<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>EM425</td>
<td>Process Engineering &amp; Design¹</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>EM425</td>
<td>Process Engineering &amp; Design¹</td>
<td>3</td>
</tr>
</tbody>
</table>

- **Total:** 3
A professional elective in Engineering & Management is a 3-credit course (or equivalent) that predominantly covers engineering or engineering management knowledge. Examples of such courses include: any sophomore, junior or senior-level course in engineering; any junior or senior level course in a topical knowledge area(s) in the Guide to the Engineering Management Body of Knowledge, 3rd edition, ASEM, 2013; courses focused on information technology.

The E&M professional electives are:
· Any course in the Wallace H. Coulter School of Engineering of 200-level or higher (prefix ES, ME, AE, CE, CH, EE, BR) for which the student has the prerequisites, except for ES 238 Introduction to Energy Systems, ES 300 Engineering for Non-engineers, EE 268 Machine Intelligence or Stupidity, and BR 200 Intro to Biomedical and Rehabilitation Engineering, Science and Technology;
· Any 300-level or higher EM course;
· HP 390 (3 credits), HP 490 (3 credits), if the research is Engineering & Management based.

Transfer courses from other universities will be assessed against the definition above by the Director of E&M, or course faculty member(s) designated by the Director, for their professional elective status.

Course designations:
ES – Engineering Science
ME – Mechanical Engineering
AE – Aeronautical Engineering
CE – Civil and Environmental Engineering
CH – Chemical and Biomolecular Engineering
EE – Electrical and Computer Engineering
BR – Biomedical and Rehabilitation Engineering
EM – Engineering Management
HP – Honors Program

See Academic Requirements for details of the Clarkson Common Experience including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements. Students are required to take five courses which cover four of the six specified CCE knowledge areas; one University course (UC) must span two Knowledge Areas.

Professional Experience Requirement is met when student completes EM120, EM121, EM432 and EM456 or the recognized equivalents of these courses. Beginning with the Class of 2017, all students will participate in a project-based professional experience such as co-op, internship, directed research or community project related to the student’s professional goals.

1 Communications intensive (CI) – Students must earn a minimum of six (6) CI points outside of UNIV190 to meet graduation requirements.
2 Information technology-based courses
3 Technology course that meets CCE requirement
4 Students must take EM456 or another senior capstone design course approved by the Director of E&M.
5 Students who take BY160 rather than CM132 will need to complete one more credit of coursework to reach 120 credits.
**BS in Innovation and Entrepreneurship**

This major is designed to leverage existing strengths in Innovation and Entrepreneurship by offering students a cross-disciplinary, flexible major that provides students with the knowledge and skills to:

- Develop and manage the innovation process;
- Plan and commercialize innovations;
- Evaluate and manage innovation opportunities;
- Participate in and manage ideation and the new product development process;
- Understand the legal and policy issues associated with new ventures; and
- Stimulate and manage the creation of new business enterprises both within and existing corporate structure and as start-up enterprises.

Toward this end, students are required to have fundamental knowledge of the creative process, market analysis and research, consumer behavior, commercialization and organizational design. Students may then also choose to deepen their knowledge by further study in negotiations, e-business, venture finance, management of technology and project management.

Students earning a degree in Innovation and Entrepreneurship must complete the Clarkson Common Experience and complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses {calculus and statistics}, two science courses {one of which must include a lab}, five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 30 credits of specialized business courses to satisfy the major requirements; and 15 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most of the electives, depending on courses chosen for the Clarkson Common Experience, will need to be taken in other schools within Clarkson University.

**Required courses include:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC370</td>
<td>Economics of Innovation</td>
</tr>
<tr>
<td>SB322</td>
<td>Designing and Leading Innovative Ventures</td>
</tr>
<tr>
<td>MK321</td>
<td>Consumer and Buyer Behavior</td>
</tr>
<tr>
<td>MK332</td>
<td>Marketing Research</td>
</tr>
<tr>
<td>MK436</td>
<td>Creativity, Innovation and New Product Development</td>
</tr>
<tr>
<td>SB437</td>
<td>Commercializing Innovation</td>
</tr>
<tr>
<td>SB440</td>
<td>Innovation and Entrepreneurship Strategy</td>
</tr>
<tr>
<td>SB305</td>
<td>Cost Management</td>
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<tr>
<td>LW471</td>
<td>Law and Society II</td>
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<tr>
<td>OM476</td>
<td>Management of Technology</td>
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<td>OM480</td>
<td>Project Management</td>
</tr>
<tr>
<td>FN455</td>
<td>Venture Capital and Private Equity</td>
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<tr>
<td>MK431</td>
<td>Supply Chain Distribution Channels</td>
</tr>
<tr>
<td>AC407</td>
<td>Taxation of Business Entities</td>
</tr>
</tbody>
</table>

Students choose three Professional Electives:

- SB305  Cost Management
- LW471  Law and Society II
- OM476  Management of Technology
- OM480  Project Management
- FN455  Venture Capital and Private Equity
- MK431  Supply Chain Distribution Channels
- AC407  Taxation of Business Entities

The following would be the typical Third- and Fourth-Year Plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirement.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Cr. Hrs.</th>
<th>Course Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK321 Consumer and Buyer Behavior</td>
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<td>MK332 Marketing Research</td>
<td>3</td>
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<tr>
<td>EC370 Economics of Innovation</td>
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<td>SB322 Designing &amp; Leading Innovative Ventures (or OS352)</td>
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<tr>
<td>OS352 Strategic Human Resource Management (or SB322)</td>
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<td>Professional Elective</td>
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<tr>
<td>FN361 Financial Management I</td>
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<td>Non-Business Elective: Clarkson Common Experience Knowledge Area requirement</td>
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<tr>
<td>Non-Business Elective</td>
<td>3</td>
<td>Free or Non-Business Elective</td>
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<table>
<thead>
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<th>Course Title</th>
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<th>Course Title</th>
<th>Cr. Hrs.</th>
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<tr>
<td>MK436 Creativity, Innovation and New Product Development</td>
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<td>SB437 Commercializing Innovation</td>
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<td>SB440 Innovation and Entrepreneurship Strategy</td>
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<td>Non-Business Elective: Clarkson Common Experience Knowledge Area requirement</td>
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<td>OS432 Organizational Policy and Strategy</td>
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<td>Free or Non-Business Elective</td>
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<td>Non-Business Elective: Clarkson Common Experience Knowledge Area requirement</td>
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BS in Financial Information and Analysis

The field of Financial Information and Analysis (FI&A) provides students with expertise in the wide range of issues common to both finance and accounting. This includes the role of accounting as the basic language of business, the importance of accounting information systems in organizational decision making, and the use of this information by financial decision makers in managing assets and investments. The knowledge and skills developed through our unique curriculum provide graduates with the abilities to succeed in a workplace that is integrating the traditional functions of finance and accounting. The FI&A curriculum gives each student a fundamental knowledge of managerial and cost accounting, and financial statement analysis. Career opportunities for graduates in FI&A include fields such as management accounting, accounting information systems design, financial management, investment management, financial services, and corporate financial planning.

Students earning a degree in Financial Information and Analysis must complete the Clarkson Common Experience and complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses {calculus and statistics}, two science courses {one of which must include a lab}, five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business courses to satisfy the major requirements; and 18 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most of the electives, depending on courses chosen for the Clarkson Common Experience, will need to be taken outside the School of Business.

An undergraduate student who successfully earns a degree in Financial Information and Analysis can apply to the Masters of Business Administration program at Clarkson. Successful completion of the MBA program, with an emphasis on accounting, allows a student to fulfill the 150 credit hour requirement necessary to sit for the certified public accounting licensure examination.

**Required courses include:**

- **SB305** Cost Accounting
- **AC311** Financial Reporting & Analysis I
- **AC312** Financial Reporting & Analysis II
- **AC407** Taxation of Business Entities
- **AC421** Accounting Information Systems
- **AC431** Advanced Accounting: Investment and Ownership Interests
- **FN/EC468** Financial Markets and Institutions
- **AC436** Auditing

- **FN464** Financial Management II
- **FN470** Strategic Financial Management
- **FN462** Investments
- **FN455** Venture Capital and Private Equity
- **FN467** International Finance
- **FN475** Portfolio Management
- **LW471** Law and Society II
- **FN474** Models for Financial Analysis
- **FN475** Professional Fund Management 1 and 2 and/or (must total at least 3 credits) *
- **FN576**

* FN575/576 may be used for only one professional elective.

The following would be the typical Third- and Fourth-Year Plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements.
### First Semester

<table>
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<tbody>
<tr>
<td>FN361 Financial Management I</td>
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<tr>
<td>Non-Business Elective: Clarkson Common Experience Knowledge Area Requirement</td>
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<td>SB305 Cost Management</td>
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<td>Free Elective</td>
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<td>OS352 Strategic Human Resource Management</td>
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<tr>
<td>Non-Business Elective: Clarkson Common Experience Knowledge Area Requirement</td>
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### First Semester

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<td>FN464 Financial Management II</td>
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<td>AC312 Fin. Reporting &amp; Analysis II</td>
<td>3</td>
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<tr>
<td>Professional Elective</td>
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<tr>
<td>Non-Business Elective: Clarkson Common Experience Knowledge Area Requirement</td>
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<td><strong>Total</strong></td>
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<tr>
<td>Non-Business Elective: Clarkson Common Experience Knowledge Area Requirement</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
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</table>
BS in Information Systems & Business Processes

The Information Systems & Business Processes (ISBP) major provides students with the knowledge and skills to integrate information technologies into the business environment. This includes an understanding of current trends in information technology as well as an ability to work with people. Together, these proficiencies provide the ability to optimize business processes and solve business problems with the power of technology. Clarkson is at the forefront of utilizing and developing information systems. Required courses in the ISBP major impart fundamental concepts like business process analysis, enterprise resource planning fundamentals, e-Business tools and models, project management, and information systems analysis and design. Students can then tailor their study plan to their career interests by choosing their professional elective courses and projects in areas such as supply chain systems modeling, enterprise resource planning, or accounting information systems.

Students graduating with the ISBP major will have the following knowledge and skills:

1. An understanding of the components of an information system: the OSI network reference model (the seven basic layers of information systems communication), network operating systems, database platforms and emerging technologies and innovations in the field.
2. A working knowledge of database, including structure and usage in multiple business contexts across disciplines, industries and organizations, and fundamental knowledge of SQL (Structured Query Language).
3. The ability to understand and map business processes across disciplines and organization.
4. The ability to analyze and design basic information systems. Students should effectively contribute to the implementation of systems that are aligned with business processes.
5. Knowledge of a variety of system platforms including .Net, SAP, Oracle and Web. Students should be aware of strengths and limitations of these platforms vis-à-vis common business processes and should be familiar with the user interface, navigation and basic administrative functions.
6. Fundamental understanding of web development and the relationship of various web-based systems with business processes, supply chain management, and e-commerce in general.
7. The ability to communicate across functional areas and across organizations with respect to information systems challenges, specifications, problem solving, and user requirements.
8. An understanding of current practices in IT outsourcing, including project specification, contracting, project management, bridging national and organizational cultures, and managing outsourcing relationships.

Knowledge of information technology, business processes and management foundations combined with skill in communicating with customers, co-workers, and vendors place ISBP students in great demand upon graduation. Graduates with backgrounds in information systems typically start their careers in the areas of database design, information analysis, or ERP consulting. With experience, graduates in this field often advance to management positions, managing consultants or marketing and project planning with information technology vendors.

Students earning a degree in Information Systems & Business Processes must complete the Clarkson Common Experience and complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses (calculus and statistics), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business
courses to satisfy the major requirements; and 18 credit hours are electives. Note that 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), so most of the electives will need to be taken outside the School of Business, depending on courses chosen for the Clarkson Common Experience.

Required courses include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS237</td>
<td>Intro. To Programming and Application Development</td>
<td>IS415</td>
<td>Data Warehousing and Data Mining</td>
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<tr>
<td>CS141</td>
<td>Intro to Computer Science</td>
<td>IS437</td>
<td>Business Application</td>
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<td>or</td>
<td></td>
<td>Development and Applications: Analysis &amp; Design</td>
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<td>EE261</td>
<td>Intro to Programming and Software Design</td>
<td>OM480</td>
<td>Project Management</td>
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<td>IS314</td>
<td>Database Design and Management</td>
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<tr>
<td>IS400</td>
<td>Business Processes</td>
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</tbody>
</table>

Students choose four professional electives, in consultation with their academic advisor, from the following list:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COMM340</td>
<td>Client Side Interactive Design - TECH</td>
<td>IS426</td>
<td>Enterprise Architecture and Integration</td>
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<tr>
<td>COMM341</td>
<td>Introduction to Web Design-IA:C2</td>
<td>COMM440</td>
<td>PHP/My SQL Interactive Design</td>
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<tr>
<td>EE361</td>
<td>Fundamentals of Software Engineering</td>
<td>COMM442</td>
<td>Advanced Worldwide Web</td>
</tr>
<tr>
<td>COMM345</td>
<td>Information Architecture</td>
<td>CS460/EE468</td>
<td>Database Systems</td>
</tr>
<tr>
<td>EE408</td>
<td>Software Design for Visual Environments</td>
<td>CS459</td>
<td>Human-Computer</td>
</tr>
</tbody>
</table>

The following would be the typical Third- and Fourth-Year Plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements. Note that for this major, IS237 Introduction to Programming and Application Development, or CS141 Introduction to Computer Science I or EE261 should be taken prior to the junior year.
### JUNIOR YEAR

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>IS400</td>
<td>Business Processes and Applications: Analysis and Design</td>
<td>3</td>
<td>IS415</td>
<td>Data Warehousing and Design</td>
<td>3</td>
</tr>
<tr>
<td>IS314</td>
<td>Database Management</td>
<td>3</td>
<td></td>
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<tr>
<td>OS352</td>
<td>Strategic Human Resource Management</td>
<td>3</td>
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<tr>
<td>FN361</td>
<td>Financial Management</td>
<td>3</td>
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<td>Non-Business Elective</td>
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#### Second Semester

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<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td></td>
<td>Professional Elective</td>
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### SENIOR YEAR

#### First Semester

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<tr>
<th>Course</th>
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<th>Course</th>
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<tbody>
<tr>
<td>OM480</td>
<td>Project Management</td>
<td>3</td>
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<td></td>
<td>Professional Elective</td>
<td>3</td>
<td>IS437</td>
<td>Business Application &amp; Development</td>
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<tr>
<td></td>
<td>Non-Business Elective: Clarkson Common</td>
<td>3</td>
<td>OS432</td>
<td>Organizational Policy and Strategy</td>
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<td>Experience Knowledge Area Requirement</td>
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<td>Free or Non-Business Elective</td>
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#### Second Semester

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<tr>
<td></td>
<td>Professional Elective</td>
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</table>

#### Total Cr. Hrs:

- First Semester: 15
- Second Semester: 15
- Total: 30
Undergraduate Minors & Concentrations in Business

Minor in Business
The minor in Business is designed for students with a major outside of the school of Business who wish to pursue a collateral area in Business. Completion of the minor provides broad exposure to the foundations of major business functions. These areas include accounting, economics, finance, law, organizational behavior, operations management and marketing. All students choosing to minor in Business must complete 18 credit hours, or six courses, from among the following:

- EC150 or EC350* Principles of Microeconomics or Economic Principles and Engineering Economics
- EC151 or EC350* Principles of Macroeconomics or Economic Principles and Engineering Economics
- AC205 Introduction to Accounting for Decision Analysis
- LW270 Law and Society I
- OS286 Organizational Behavior
- FN361 Financial Management I
- OM331 Operations & Supply Chain Management**
- MK320 Principles of Marketing**

*A student may not take EC150 or EC151 if a student has taken EC350. Entry to EC350 is limited to students who have declared a major in Engineering and Management or a major in the School of Engineering.

**IS200 is a 1-credit required corequisite.

Minor in Economics
The development of an understanding in economics is not only necessary for all managers but also for all those seeking to understand how and why economic forces affect and shape the society and the world we live in. The success of any business ultimately depends on the decisions its managers make concerning the allocation of resources under differing market and economic conditions. Successful decision making requires a good understanding of markets and the central role that economic incentives play within and outside the firm. The Clarkson economics minor is designed to give students the basic tools and analytical background in economic analysis. The minor in economics can complement almost any major, whether in arts and sciences, business or engineering. The minor in economics consists of 18 credit hours of economic courses as follows:

- Principles of Microeconomics (EC150, EC350* or equivalent)
- Principles of Macroeconomics (EC151, EC350* or equivalent)
- **Econometrics and Business Statistics (EC311 or equivalent)

Three electives (9 credit hours) of 300- or 400-level EC designated courses if a student has taken EC150 and
EC151. Four electives (12 credit hours) of 300- or 400-level EC designated courses if a student has taken EC350.  
*A student may not take EC150 or EC151 if a student has taken EC350. Entry to EC350 is limited to students who have declared a major in Engineering and Management or a major in the School of Engineering.
** Students who have completed Stat 383 – Probability and Statistics are exempt from EC311 but will have to complete another upper level Economics course to replace EC 311.

**Minor in Human Resource Management**
The minor in Human Resource Management consists of the following courses totaling 15 credits:
- OS286/PY286/EM286 Organizational Behavior
- OS352 Strategic Human Resource Management
- OS452 Advanced Human Resource Management
- And two of the following courses:
  - EC475 Personnel Economics
  - EHS330 Safety Analysis - Environmental, Health, and Safety Assessment
  - LW 466 Law of the Workplace
  - OS466 Negotiations and Relationship Management

**Minor in Law Studies**
The minor in Law Studies is designed for students with an interest in studying law. The minor is beneficial for students who wish to structure their academic program to help prepare for law school. The minor will also serve the needs of students such as those who have an interest in human resources management, political science, construction management and supply chain management who want to learn more about the field of law and its many diverse issues and perspectives. All students choosing to minor in Law Studies must complete 18 credit hours (six courses) and satisfy requirements indicated below.

The following courses are required:
- LW270 Law and Society I
- LW/POL499 Law Studies Minor Portfolio (no credit)

Students choose two courses from the following list of courses with substantive law content:
- LW466 Law and the Workplace
- LW471 Law and Society II
- POL375 Environmental Law
- POL400 Constitutional Law

Students choose two courses related to social and policy issues. The list below includes such courses. For the complete list, contact either the Associate Dean of Arts & Sciences at 315-268-6411 or the Associate Dean of Business at 315-268-2300.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ANTH332</td>
<td>Cities and Social Justice</td>
</tr>
<tr>
<td>COMM428</td>
<td>Public Debate and the Environment</td>
</tr>
<tr>
<td>PHIL240</td>
<td>Contemporary Moral Issues</td>
</tr>
<tr>
<td>COMM310</td>
<td>Mass Media and Society</td>
</tr>
<tr>
<td>Course Code</td>
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</tr>
<tr>
<td>PHIL/POL380</td>
<td>Law and Bioethics</td>
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<tr>
<td>PHIL243</td>
<td>Business Ethics</td>
</tr>
<tr>
<td>LW490</td>
<td>Internship (subject to availability)</td>
</tr>
<tr>
<td>PHIL341</td>
<td>Professional Ethics</td>
</tr>
<tr>
<td>EC320</td>
<td>Social and Political Issues in the Adirondacks</td>
</tr>
<tr>
<td>PHIL310</td>
<td>World Religions &amp; Contemporary Issues</td>
</tr>
<tr>
<td>SOC330</td>
<td>Health, Wealth, Integrity &amp; Environment</td>
</tr>
</tbody>
</table>

Students must complete one communication course. The list below includes such courses. For the complete list, contact either the Associate Dean of Arts & Sciences at 315-268-6411 or the Associate Dean of Business at 315-268-2300.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>COMM210</td>
<td>Theory of Rhetoric for Business, Science and Engineering</td>
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<tr>
<td>COMM410</td>
<td>Theory and Philosophy of Communication</td>
</tr>
<tr>
<td>COMM217</td>
<td>Introduction to Public Speaking</td>
</tr>
<tr>
<td>PHIL330</td>
<td>Logic for Critical Thinking</td>
</tr>
</tbody>
</table>

**Minor in Quality-based Project Management**

Clarkson University offers a minor in Project Management that is available to all undergraduate students. This minor is intended for students in all majors who want to prepare themselves for potential careers in project-centered work. A unique benefit of this minor is that students can pursue certification through the Project Management Institute (PMI)™ after completing the requirements of minor. PMI’s Certified Associate of Project Management (CAPM)® is considered the pathway to the Project Management Professional (PMP)® certification that is rapidly emerging as one of the fastest growing professional certifications in many industries and career areas. Additionally, certain students may opt to sit for the American Society for Quality’s “Certified Quality Improvement Associate” exam since the OM485 course covers the body of knowledge for that particular certification. Students who pursue the minor are under no obligation to sit for the CAPM® or CQIA®, which require an application and separate fee, completed and paid for by the student.

To achieve a minor in “Quality-based Project Management,” students must maintain a 2.0 average in the five (5) three-credit courses, distributed in the following fashion:

A. All three (3) of these courses:
   - OM/EM480 Project Management (Prerequisite: statistics course)
   - OM/EM351 Quality Management and Lean Enterprise (Prerequisite: statistics)
   - SB305 Cost Management

B. Elective Courses (Choose any pair):
   - OS/EM286 Organizational Behavior (Prerequisite: sophomore standing)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
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<tbody>
<tr>
<td>OS352</td>
<td>Strategic Human Resource Management</td>
<td>(Co/Prerequisite: IS211 or IS200, Prerequisite: OS286)</td>
</tr>
<tr>
<td>OS/EM286</td>
<td>Organizational Behavior</td>
<td>(Prerequisite: sophomore standing)</td>
</tr>
<tr>
<td>OS466</td>
<td>Negotiations and Relationship Management</td>
<td>(Prerequisite: OS286)</td>
</tr>
<tr>
<td>OM/EM331</td>
<td>Operations and Supply Chain Management</td>
<td>(Pre/Corequisite: IS211 or IS200; Prerequisite: statistics)</td>
</tr>
<tr>
<td>OM/EM476</td>
<td>Management of Technology</td>
<td>(Prerequisite: OM331)</td>
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**Concentration in Global Supply Chain Management for E&M Majors**

The principles behind supply chain management focus on developing seamless flows of raw materials, products/services, information, and financial capital. The supply chain starts at the initial design process and includes raw material sourcing, logistics and continues through the delivery of that product or service to the end customer, with a goal of creating customer satisfaction at optimal cost.

A concentration in Global Supply Chain Management offered through the School of Business is available to E&M students. It requires 15 or more credit hours of specified coursework. Completion of an approved concentration is indicated on a student’s transcript.

Students must take these classes:

- EM 341 Global Sourcing & Supply Chain Design
- EM 381 Logistics Management
- IS 428 Info. Systems for Supply Chain Mgmt.

Additionally, students must choose two courses from the following:

- EM 351 Quality Mgmt. & Lean Enterprise
- OS 466 Negotiations & Relationship Mgmt.
- EM 361 Supply Chain Environmental Mgmt.

**Pre-Law**

Pre-law advising is available for students in the School of Business to help them develop academic programs that will serve as a strong foundation for future legal studies. A list of pre-law advisors is available through the dean’s office in the School of Business. The advisors provide counseling and information about law schools and careers in law.

**Global Study Requirement**

All business majors area required to complete a global student requirement. Students interested in cultural and trade relations between the United States and other countries may participate in the University International Student Exchange Program. It is expected that qualified students will complete a study exchange for at least one semester. Please refer to Clarkson’s International Center for more details on this program. If a student is not eligible for the Student Exchange Program, there are other options available for
the student to fulfill the global study requirement including participation in a two-three-week faculty-led trip (UNIV399 Global Business Experience) to a foreign country.

Co-ops, Internships and Professional Experience
Students interested in gaining work experience and fulfilling their professional experience requirement while in college are encouraged to participate in the University Co-op or Internship Program. Please refer to the Career Center for more details on these programs. Additionally, the School of Business may approve internships arranged by a student as fulfilling the professional experience requirement.

The Reh Center for Innovation and Entrepreneurship
The Entrepreneurship Center
Erin Draper, Director

A resource center located within the Clarkson University School of Business, the Entrepreneurship Center helps small business owners and entrepreneurs develop and manage sustainable micro enterprises through partnerships with universities and government support programs.

The Center builds upon the University's nationally recognized expertise in entrepreneurial education and long-standing commitment to boost regional economies through small business development.

The goal of the Center is to serve as a national model for enhancing regional economic development by focusing on micro enterprises. Additionally, increased hands-on learning opportunities provide students with tremendous learning opportunities in marketing, management and finance.
In our modern technological society, engineers and scientists must work together with a variety of other professionals in seeking solutions to complex problems. Revolutionary advances in applied science and technology have broadened the horizons of engineering. At the same time, these advances have created a multitude of challenging multidisciplinary problems in virtually every sphere of human activity.

The role of engineers in today’s society has become more and more critical. Engineers require not only a knowledge of fundamentals for finding solutions to problems, but they must be aware of the broad social, economic, political, and environmental implications of their ventures. The engineering programs at Clarkson are designed to provide students with a foundation in science, engineering, humanities, and management. Our goal is to make sure Clarkson graduates are highly competent in their chosen fields while at the same time they are alert on their responsibilities to society and truly practice “technology serving humanity.”

In preparing students to become effective contributors to society and industry, Clarkson University has developed an award-winning program called SPEED (Student Projects for Engineering Experience and Design). The current seventeen SPEED projects, including FIRST Robotics and Mini-Baja, encompass multidisciplinary and socially responsible approaches to solving real-world problems. Not only do the SPEED projects involve design and fabrication, they also incorporate marketing, public relations, communications, and management resulting in teams being made up of engineering, business, science, and liberal arts students. The Coulter School also provides opportunities for research experience for undergraduates (REU) involving participation of students in faculty research labs. These programs offer opportunities for students to amass the necessary "real-world" experiences and professional skills through several engineering design projects and research experiences.

In spring 2002, Clarkson announced that the Wallace H. Coulter Foundation had made a $30 million commitment to the University in support of ongoing excellence in its engineering and science programs. This gift reinforces and broadens Clarkson’s most successful learning and research activities in support of the theme “Technology Serving Humanity.”

Clarkson’s School of Engineering has been named the Wallace H. Coulter School of Engineering in recognition of the Foundation’s generous gift and the late Wallace Coulter’s dedication to the University as a trustee. Wallace H. Coulter was a renowned inventor and entrepreneur. He became acquainted with Clarkson through his collaboration with colloid scientists on the faculty. In 1979 he received an honorary doctorate, and he served as a trustee of the University from 1983 to 1989. Through the years he maintained close connections with Clarkson, supporting research projects and establishing an endowed scholarship.

The grant funds five key areas: team project-based learning activities; endowed chairs and endowed fellowships; a new program in rehabilitation engineering; upgrades of laboratory facilities; and scholarships
for both minority students and women pursuing a degree in engineering. Growth in these evolving areas will complement and reinforce the programs and curricula described in this catalog.

The Coulter School of Engineering comprises the Departments of Chemical and Biomolecular, Civil and Environmental, Electrical and Computer, and Mechanical and Aeronautical Engineering.

**UNDERGRADUATE PROGRAMS**
The eight-semester undergraduate degree granted in engineering is the Bachelor of Science (BS), with specialization in one of the eight programs are accredited by the Engineering Accreditation Commission of ABET, [http://www.abet.org](http://www.abet.org):

- Aeronautical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Engineering & Management
- Mechanical Engineering
- Software Engineering
- Environmental Engineering

A candidate for the bachelor’s degree must not only pass all prescribed courses in one of the eight-semester engineering curricula, but must also meet all of the other graduation requirements and Clarkson Common Experience requirements.

**Minors and Professional Concentrations**
Clarkson’s engineering curricula contain a number of elective courses. Furthermore, many students have room for additional courses through advanced placement, overloading, and by taking courses in the summer. Therefore, engineering students, in consultation with their advisors, have an opportunity to formulate academic programs that reflect individual interests, career goals, and areas of professional specialization. See Professional Concentrations in Engineering and Minors and Concentrations.

**Engineering Studies**
Some students entering the School of Engineering are not sure which academic discipline to pursue. These students may choose the Engineering Studies Program. A Director of Engineering Studies and support faculty serves as advisors to these students and assists them in selecting curricula. For additional information, consult with the Associate Dean of Engineering for Academic Programs at 315-268-6446. The Engineering Studies classification provides students with an opportunity to learn more about various programs within the School of Engineering prior to selecting a specific program. Undergraduates may choose between; Aeronautical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering and Software Engineering.

**Combined BS Engineering /MBA or ME/MBA Programs**
By proper selection of electives, in five years a Clarkson student can receive a BS in engineering and a master’s degree in business administration. This may require course overloads in some semesters and/or
attendance at summer school. Interested students should contact the School of Business regarding the five-year BS/MBA option. Students with a B.S in engineering also have an option to earn both a master’s degree in engineering and a master’s degree in business administration in two years. For information on the two-year joint ME/MBA program, see the description of the program in the Graduate Engineering Programs section of the Catalog.

Pre-Law
Pre-law advising is available for engineering students to help them develop academic programs that will serve as a strong foundation for future legal studies. For information contact the Pre-Law Adviser at 315-268-2300.

Engineering Student Organizations and Design Competitions
In addition to the University organizations, Clarkson has student-led chapters of the following professional organizations:

- American Institute of Chemical Engineers
- American Society of Civil Engineers
- Institute of Electrical and Electronic Engineers
- American Society of Mechanical Engineers
- Society of Women Engineers
- Association of General Contractors
- American Institute of Aeronautics and Astronautics
- American Indian Science and Engineering Society
- National Society of Black Engineers
- Society of Automotive Engineers
- New York Water Environment Association
- Society for Hispanic Professional Engineers

Each department has an honorary society, and there is an all-engineering honorary society. Students can participate in national competitions, often for course credit through the Multidisciplinary Project (MP) or Multidisciplinary Team (MT) course system, via the following:

- Concrete Canoe
- Construction Management
- Clean Snowmobile
- Zero Emission Snowmobile
- Chem E Car
- Design, Build, Fly
- Engineers Without Borders
- Environmental Design
- FIRST Robotics
- Formula SAE
- Mini-Baja
- Steel Bridge
- Timber Bridge
- Revolutionary Aerospace Systems Concepts Academic Linkage (RASCAL)
Transfer Programs
Both 2+2 and 3+2 transfer programs are available at Clarkson.

Faculty
Chemical and Biomolecular Engineering
John B. McLaughlin — Chair; Professors S.V. Babu, Ruth Baltus, John B. McLaughlin, David Mitlin, Eunsu Paek, Don H. Rasmussen, Marco Aurelio Satyro, Ross Taylor, William R. Wilcox; Associate Professors Richard J. McCluskey, Sitaraman Krishnan; Assistant Professors, Yuncheng Du, Selma Mededovic, Zijie Yan; Adjunct Professor Ian I. Suni; Research Associate Professor Xinli Jia;

Civil and Environmental Engineering
James Edzwald, Professor and Chair of Civil and Environmental Engineering; Professors James S. Bonner, John P. Dempsey, Andrea R. Ferro, Stefan J. Grimberg, Thomas M. Holsen, Feng-Bor Lin, Kerop D. Janoyan, Levon Minnetyan, Susan E. Powers, Weiming Wu, Poojitha D. Yapa; Associate Professors Narutoshi Nakata, Sulapha Peethamparan, Shane Rogers, Steven Wojtkiewicz; Assistant Professors, Ian Knack, Jiaqi Ma, Tyler Smith, Khiem Tran; Distinguished Research Professor in Hydraulic Engineering Hung Tao Shen; Research Professor Hayley H. Shen Instructor and Director of Construction Engineering Management Erik Backus; Adjunct Associate Professor, Brooks Washburn; Instructor, William Olsen, Milani S. Sumanasooria; Adjunct Instructor Cory McDowell, Adjunct Instructor Jared Heinl; Professor Emeritus Norbert L. Ackermann, Gordon B. Batson

Electrical and Computer Engineering
William Jemison — Professor and Chair of Electrical and Computer Engineering; Professors Cetin Cetinkaya, Paul B. McGrath, Thomas H. Ortmeyer, Ming-Cheng Cheng, Charles Robinson, Stephanie Schuckers; Associate Professors, James J. Carroll, Chuan He, Daqing Hou, Abul N. Khondker, Jack Koplowitz, Lei Wu, Jeanna Mathews; Assistant Professors, Mahesh Krishna Banavar, Meline Erol Kantarcı, Burak Kantarcı, Jie Li, Chen Liu, Sanjib Kumar Banerjee, Chee-Keong Tan; Distinguished Research Professor Liya L. Regel; Visiting Instructor Timothy Fanelli, Daniel Rissacher, Ajay Sonar

Mechanical and Aeronautical Engineering
Daniel Valentine Professor and Chair of Mechanical and Aeronautical Engineering; Professors Goodarz Ahmadi, Daryush K. Aidun, Cetin Cetinkaya, Suresh Dhaniyala, Brian Helenbrook, John C. Moosbrugger, Kenneth Willmert; Associate Professors Ajit Achuthan, Doug Bohl, Kevin Fite, Kathleen Issen, Laurel Kuxhaus Ronald S. LaFleur, Marcias Martinez, Pat Piperni, Kenneth D. Visser, Steven W. Yurgartis; Assistant Professors Byron Erath, Ioannis Mastorakos, Craig Merett, Arthur Michalek, Parisa Mirbod, Philip Yuya; Instructor Ronald Buckingham; Adjunct Professors William Arnold, David Wells

Undergraduate Engineering Programs
Common First-Year Engineering Curriculum
For all majors except Engineering & Management, the first two semesters are identical in the undergraduate engineering curricula. Therefore, students may defer the selection of a major field of study until the sophomore year. Beginning with the junior year, a significant amount of specialized material is incorporated into each curriculum. In the senior year, coursework is
concentrated in the student’s chosen field. Courses in humanities and social sciences are taken throughout the four-year program as part of the Clarkson Common Experience.

**The Common First-Year Curriculum in Engineering***

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM131</td>
<td>Chemistry I</td>
<td>4</td>
<td>CM132</td>
<td>Chemistry II (or BY 160 Biology II**)</td>
<td>4 (3)</td>
</tr>
<tr>
<td>PH131</td>
<td>Physics I</td>
<td>4 (3)</td>
<td>PH132</td>
<td>Physics II</td>
<td>4</td>
</tr>
<tr>
<td>MA131</td>
<td>Calculus I</td>
<td>3</td>
<td>MA132</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>UNIV190</td>
<td>Clarkson Seminar</td>
<td>3</td>
<td>ES110</td>
<td><em>Engineering and Society or Equivalent</em>**</td>
<td>3</td>
</tr>
<tr>
<td>FYE100</td>
<td>First-Year Seminar</td>
<td>1</td>
<td>ES100</td>
<td>Introduction to Engineering Use of the Computer</td>
<td>2</td>
</tr>
</tbody>
</table>

15 (14) 16 (15)

*This is a typical curriculum sequence, listing courses that are required of all engineering majors, except Engineering and Management. Not all students will complete these courses in the first year. For example some students will take ES 110 in lieu of PH 131 in the first semester, then PH 131 in the second semester and PH 132 in the third semester.

**Mechanical, Aeronautical, Electrical, Computer, and Software Engineering majors can substitute BY 160 for CM 132. Chemical, Civil and Environmental Engineering require CM132. Students who do not also take BY 162 (Biology II Laboratory) should consult with their advisor to insure they will meet the 120 credit hour requirement.

*** ES 110 or equivalent is a required Knowledge Area course. A total of five Knowledge Area courses must be taken, and these five courses must cover at least four of the six knowledge areas. At least one of these courses must be a university course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an economics course, EC350 is required for most degrees.

**BS in Aeronautical Engineering**

The objectives of the Aeronautical Engineering program are tailored so that graduates

1. will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of aircraft and related systems and understand the social, ethical, and environmental context of their work;

2. will communicate clearly, collaborate competently in teams, and assume leadership roles;

3. and will have the habit of continuous professional development.

The program outcomes are the generic abilities that graduates will demonstrate that they have acquired. The defining characteristics of professional problems and the process used to solve them lead directly to these generic program outcomes:
• An ability to apply knowledge of mathematics, science, and engineering, an ability to design and conduct experiments, as well as to analyze and interpret data. (ABET a& b)

• An ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, and an ability to function on multidisciplinary teams. (ABET c & d)

• An ability to identify, formulate, and solve engineering problems, and an understanding of professional and ethical responsibility. (ABET e & f)

• An ability to communicate effectively, and the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context. (ABET g & h)

• A recognition of the need for, and an ability to engage in life-long learning, and a knowledge of contemporary issues. (ABET i & j)

• An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (ABET k)

The Aeronautical engineering program expects that graduates have a knowledge of aerodynamics, aerospace, structures, propulsion, flight mechanics, and stability and control. It is also expected that graduates have design competence that includes integration of various disciplines within aeronautical engineering.

Curriculum Overview: The 120-credit program contains 87 credit hours of required technical courses, 33 credit hours of electives (including two professional electives, one undesignated elective and five Knowledge Area/University Course, KA/UC, electives).

Required Technical Courses: The first two years of the curriculum cover mathematics, physics, chemistry and engineering science courses (including basic principles of statics, dynamics, solid mechanics, electrical circuits, materials and the use of computers).

In the third and fourth years, students take specialized courses on topics such as aerodynamics and flight mechanics. These courses provide knowledge and skills that strongly support the second outcome listed above, which is a key element in aircraft design. The laboratory components of the first-year physics and chemistry courses introduce study of the relationship between theory and reality. This fosters the development of the student’s technical intuition. Aeronautical engineering laboratory courses add to this development.

Training in professional problem-solving begins in the spring of the second year, with the first course in engineering design. The first course to train students formally in the solution process, it lays the foundation for the fourth-year capstone design course. In the capstone course, students work in teams to design an aircraft. Thus, they learn to apply the solution process to a real professional problem. Students may acquire additional professional experience by participating in the Design, Build, and Fly Competition team. Or they may participate in the Formula SAE, Mini-Baja, Clean Snowmobile, or other team competitions, which are open to any student.

Common Curriculum Requirements: Plans of study must include a total of five Knowledge Area (KA) courses. Students will select these so that at least one is a designated University Course, and so that together these five courses cover four knowledge areas. Communication intensive course requirement will be fulfilled by a combination of courses having one or two communication points each, with a total of six
points required for graduation. At least two of these six points will be earned through 300- or 400-level courses required in the major.

Professional and Undesignated Electives: The professional electives must meet criteria in the Mechanical and Aeronautical Engineering (MAE) Department Student Handbook1. The undesignated elective may be any college-level course that does not contain a significant amount of material already covered in other courses New York state. It could be chosen to enrich the student’s technical or nontechnical background. Advanced (200-level or above) Aerospace Studies or Military Science courses may be used as undesignated electives.

### Curriculum

**FIRST YEAR**  
*(See Common First-Year Curriculum in Engineering)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS/AS</td>
<td>Military Science/Aerospace Studies (if elected)</td>
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<td>MS/AS</td>
<td>Military Science/Aerospace Studies (if elected)</td>
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**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES220</td>
<td>Statics</td>
<td>3</td>
<td>ES222</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
<td>ES223</td>
<td>Rigid Body Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ES260</td>
<td>Materials Science</td>
<td>3</td>
<td>AE/ME212</td>
<td>Intro to Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>MA232</td>
<td>Elementary Differential Equations</td>
<td>3</td>
<td>MA231</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KA/UC Elective</td>
<td>3</td>
<td>AE201</td>
<td>Mechanical Engineering</td>
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</tr>
<tr>
<td></td>
<td>Lab I</td>
<td>1</td>
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<td>KA/UC Elective</td>
<td>3</td>
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### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>ES330</td>
<td>Fluid Mechanics</td>
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<td>AE/ME425</td>
<td>Aerodynamics</td>
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<tr>
<td>ES340</td>
<td>Thermodynamics</td>
<td>3</td>
<td>AE429</td>
<td>Aircraft Performance and Flight Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>AE/ME350</td>
<td>Aircraft Structures</td>
<td>3</td>
<td>AE429</td>
<td>Design of Aircraft Structures</td>
<td>3</td>
</tr>
<tr>
<td>AE/ME455</td>
<td>Mechanical Vibrations and Control</td>
<td>3</td>
<td>AE458</td>
<td>Design of Aircraft Structures</td>
<td>3</td>
</tr>
<tr>
<td>AE301</td>
<td>Mechanical Engineering Lab II</td>
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<td>AE401</td>
<td>Mechanical Engineering Lab III</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td>Undesignated Elective</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Advanced Engineering Math**</td>
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<td></td>
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<td>16</td>
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### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
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<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE450</td>
<td>Aircraft Design I</td>
<td>3</td>
<td>AE451</td>
<td>Aircraft Design II</td>
<td>3</td>
</tr>
<tr>
<td>AE430</td>
<td>Stability Control of Aerospace Vehicles</td>
<td>3</td>
<td>AE427</td>
<td>Design of Propulsion Systems</td>
<td>3</td>
</tr>
<tr>
<td>AE/ME431</td>
<td>Gas Dynamics</td>
<td>3</td>
<td>Professional Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>Professional Elective</td>
<td>3</td>
<td>KA/UC Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economics Elective</td>
<td>3</td>
<td></td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

** or MA331 and STAT383

For professional concentrations see Professional Concentrations in Engineering.
BS in Chemical Engineering

A BS degree in Chemical Engineering is a good foundation for many diverse careers. The objectives of the program are to produce graduates who are able to:

1. Practice chemical engineering in traditional and emerging fields.
2. Be successful at pursuing advanced degrees.
3. Be motivated to continuously develop their knowledge and skills.
4. Contribute to society and maintain ties to the University.

Chemical engineers deal with many aspects of an industrial society, especially those challenges involving chemistry. Chemical engineers engage in a spectrum of manufacturing, sales, and research activities in a variety of industries ranging from specialty chemicals to semiconductors and food processing. Therefore, it is essential that they master the fundamentals of chemistry, physics, mathematics, and engineering science. Courses in these fundamentals constitute most of the first year and sophomore year. Junior-year courses concentrate on the application of mathematics, physics, and chemistry to the physical operations and chemical processes required to obtain a desired product on an industrial scale. The senior year is composed chiefly of capstone design and laboratory courses plus electives, permitting students to concentrate on areas in which they have developed a special interest. In the capstone courses, students work in teams on open-ended projects that illustrate how engineering design concepts, introduced in the sophomore and junior chemical engineering courses, are applied in professional practice.

The basic four-year curriculum prepares graduates for immediate employment in a large number of industrial and government organizations as well as for graduate work in chemical engineering or related fields. The positions traditionally filled by chemical engineers involve the design, construction, and management of chemical, petrochemical, pharmaceutical, biochemical and electronics manufacturing plants; research and development of new processes and products; improvement of existing processes and products; design and development of control systems; economic evaluation of new plants and processes; air and water pollution control; energy conservation and energy resource development; and materials engineering. The student is encouraged to develop a special interest and to take a concentration of courses in that area.

The chemical engineering curriculum is designed to offer sufficient flexibility to satisfy the interests and needs of many different individuals. The curriculum provides students with a solid background for continuing their education to the MS, ME. or PhD degree in chemical engineering, environmental engineering, materials science, and other technical areas. By appropriate selection of electives, the student can also use the chemical engineering program as preparation for graduate work in law, management, medicine, or biotechnology. Personal faculty advising is provided to assist students in the selection of electives that best suit their career goals.
**Chemical Engineering Curriculum**

**FIRST YEAR**  
*(See Common First-Year Curriculum in Engineering)*

First-year students in chemical engineering may substitute CM103, 104, and 105 for CM131 and 132. This enables them to take chemistry and chemistry laboratories with the first-year students majoring in chemistry.

**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>CH210</td>
<td>Molecular Properties</td>
</tr>
<tr>
<td>CM242</td>
<td>Organic Chemistry II</td>
</tr>
<tr>
<td>CH220</td>
<td>Mass Balances</td>
</tr>
<tr>
<td>MA232</td>
<td>Differential Equations</td>
</tr>
<tr>
<td>CM241</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>MA231</td>
<td>Calculus III</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>OR PH132 Physics II</td>
<td>0</td>
</tr>
<tr>
<td>ES499</td>
<td>Prof Experience</td>
</tr>
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</table>

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>CH320</td>
<td>Applied Chemical &amp; Phase Equilibria</td>
</tr>
<tr>
<td>CH330</td>
<td>Transfer Process Fundamentals</td>
</tr>
<tr>
<td>CM244</td>
<td>Organic Chemistry Lab</td>
</tr>
<tr>
<td>EC350</td>
<td>Economic Principles &amp; Engr. Economics</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective (Engineering)</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>
### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Cr. Hrs.</th>
<th>Course Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH410 Chemical Engineering Lab II</td>
<td>2</td>
<td>CH460 Process Dynamics &amp; Control</td>
<td>3</td>
</tr>
<tr>
<td>CH420 Process Economics &amp; Conceptual Design</td>
<td>3</td>
<td>KA/UC Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective (ES)</td>
<td>3</td>
<td>Technical Elective 1</td>
<td>3</td>
</tr>
<tr>
<td>KA/UC Elective</td>
<td>3</td>
<td>Undesignated Electives 1,2</td>
<td>6</td>
</tr>
<tr>
<td>Elective (Engineering) 1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

1The eight elective courses must be approved by the student’s faculty advisor and must be distributed as follows:

Two courses (each from a different field) among materials science, electrical science, and mechanics; one course in mathematics; three courses in engineering, two courses in engineering, science, or mathematics; two undesignated electives. An “undesignated elective” is any course that does not contain a significant amount of material already covered in the student’s program.

2 Six credits of Military Science or Aerospace Studies may be used to satisfy the requirement for two of the undesignated electives.

### Professional Specializations

Students can develop a specialty by proper selection of electives. One very effective choice is a concentration or a minor in another field such as Biomolecular Engineering Chemistry, Environmental Health Science, Biomedical Engineering, Sustainable Energy Systems, Communication, Environmental Engineering, Materials Engineering, or Business. Not all courses listed are offered every year. See Professional Concentrations in Engineering and Undergraduate Minors in Engineering.

### CHEMICAL ENGINEERING HONORS PROGRAM

Chemical engineering students with a GPA of 3.5 or better and aiming for an academic or industrial research career may apply to the Honors Program at the end of the sophomore year. Course requirements in addition to the regular curriculum include:

1. CH490 Transport Phenomena
2. Two math electives (the present elective plus one more) to be chosen from the following list:
   - CH561 Chemical Engineering Analysis
   - ES505 Design of Experiments and Analysis of Data
   (only one of the above two may be chosen)
   - MA331 Fourier Series and Boundary Value Problems
   - MA339 Applied Linear Algebra
   - MA377 Numerical Methods
BS in Civil Engineering

Civil engineers plan, design, and construct our nation’s physical infrastructure and take a leadership role in the responsible development and protection of our natural resources. Accordingly, the field of civil engineering encompasses several distinct disciplinary themes, including architectural engineering, construction engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering, among others.

Civil engineers always have been at the forefront of such activities as designing and constructing bridges, buildings, water and wastewater treatment facilities, hydropower stations, storm drainage systems, airports, aerospace structures, and other public works. They also have taken a leadership role in eliminating the hazardous and solid wastes of society, responsibly developing surface and groundwater resources for beneficial use, managing environmental quality and minimizing the effects of pollutants, mitigating earthquake damage in large structures, and using artificial intelligence to improve the operation of transportation systems.

Within the context provided by the broad profession of civil engineering described above, the mission of the Civil and Environmental Engineering Department, formally stated, is to educate talented and motivated men and women to become successful professionals through quality undergraduate and graduate programs that place a high priority on student access and interaction with faculty. This mission statement establishes the educational framework for the civil engineering degree program at Clarkson, and the curriculum objectives given below provide more detail about the program.

Curriculum Objectives

With an appreciation for the disciplinary diversity of Civil Engineering, Clarkson’s Department of Civil and Environmental Engineering actively pursues the educational goal of providing talented and motivated men and women with the knowledge and intellectual tools required to become successful civil engineers. It does so by permitting students to pursue individual disciplinary interests or to remain broadly based in all areas of Civil Engineering while obtaining an accredited BSCE degree (Bachelor of Science in Civil Engineering). The program objectives may be stated as shown below:

- Develop students whose engineering knowledge can meet the challenges of a successful professional career.
- Ensure students acquire good communication and leadership skills.
- Foster an intellectually stimulating environment for professional development.
- Develop a relationship between students and faculty that produces a personal interest in the student’s education and professional development.

Moreover, the Department’s approach to the achievement of these objectives may be summarized as:

- Offering a quality undergraduate program that places a high priority on student access and faculty interaction within an environment that is intellectually stimulating and encourages professional development,
• Providing its graduates with the engineering knowledge needed to meet the life-long challenges of a successful professional career, and valuing good communication and leadership skills.

It is expected that graduates from the BSCE program will demonstrate achievement of these objectives within a few years after completing the program. Science and engineering-science courses form the majority of the curriculum in the first two years. These courses provide the base for the professionally oriented courses in the junior and senior years. The curriculum is designed to provide all graduates with a theoretical foundation as well as design experiences in structural, geotechnical, water resources, and environmental engineering. This foundation is typically achieved in the junior year, enabling students to use the senior year to select elective courses in areas where their particular interests have developed. In the senior year a capstone design course culminates the development of design skills that were first introduced in the sophomore year and enhanced in subsequent courses.

Students can select elective courses in areas beyond the required courses, such as construction and transportation, or can use the elective portion of the curriculum to concentrate in selected areas such as architectural engineering, construction engineering, structural engineering, environmental engineering, materials engineering, or communications.

The guiding principle is that the student and faculty advisor together create a program of study that best satisfies the student’s individual career objectives.

Civil Engineering Curriculum

FIRST YEAR
(See Common First-Year Curriculum in Engineering)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES220</td>
<td>Statics</td>
<td>3</td>
<td>ES222</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE212</td>
<td>Intro. to Engineering</td>
<td>3</td>
<td>MA232</td>
<td>Elem. Differential</td>
<td>3</td>
</tr>
<tr>
<td>MA231</td>
<td>Calculus III</td>
<td>3</td>
<td>MA232</td>
<td>Elem. Differential</td>
<td>3</td>
</tr>
<tr>
<td>ES Elective¹</td>
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<td>ES Elective¹</td>
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<tr>
<td>KA/UC Elective or PH132</td>
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<td>KA/UC Elective</td>
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<td><strong>15</strong></td>
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<td></td>
<td><strong>15</strong></td>
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JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Elective</td>
<td></td>
<td>3</td>
<td>CE310</td>
<td>Geotechnical Eng. I w/lab</td>
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</tr>
<tr>
<td>CE320</td>
<td>Structural Analysis</td>
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<td>ES Elective¹</td>
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<td>3</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Cr. Hrs.</td>
<td>Course</td>
<td>Title</td>
<td>Cr. Hrs.</td>
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</tr>
<tr>
<td>CE330</td>
<td>Water Resources w/lab</td>
<td>3</td>
<td>CE340</td>
<td>Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Professional Elective</td>
<td></td>
<td>CE301</td>
<td>Geospatial Science w/lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KA/UC Elective</td>
<td>3</td>
<td>CE441</td>
<td>Or CE442 Structural Design Elective</td>
<td></td>
</tr>
<tr>
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<td>15</td>
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<td>15</td>
</tr>
</tbody>
</table>

### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC350</td>
<td>Engineering</td>
<td>3</td>
<td>CE490</td>
<td>CE491, or CE492</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economics</td>
<td>3</td>
<td></td>
<td>or CE493</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>3</td>
<td></td>
<td>Senior Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>12</td>
<td></td>
<td>Professional Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>


A total of 16.5 design credits are required to be accumulated. Required courses provide 11.5 design credits.

### Professional Specializations

Through the selection of electives, students can achieve proficiency in particular areas of interest. Elective courses can be selected from those offered by the Civil and Environmental Engineering Department and by other departments. Those electives considered especially appropriate to the various areas of specialization in civil engineering are provided in the following topical listings. Not all courses are offered each year or each semester (see annual Courses publication). All 500-numbered courses are graduate level.

Undergraduate students enrolled in 500-level courses must have a cumulative grade-point average of at least 3.0, and permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have a cumulative grade-point average of at least 3.0, and must have permission of their advisor, department chair, and the dean of Engineering. See Professional Concentrations in Engineering.

### Professional Concentrations in Civil Engineering:

**Architectural Engineering**

CE448 Introduction to Architectural Engineering  
CE445 Timber Design or CE446 Reinforced Masonry Design  
CE 415/515 Foundation Design  
CE 441 Reinforced Concrete Design  
CE 442 Steel Design  
CE 492 Senior (Building, Architectural) Design

*And at least two of the following courses:*
CE 405 Construction Management
CE 408 Building Information Modeling and Integrated Product Delivery
CE 411 Construction Materials
CE 420/520 Advanced Structural Analysis
CE 421/521 Composite Mechanics and Design
CE 457/557 Environmental Degradation of Concrete Structures
CE 453/553 Properties and Performance of Concrete Materials

CE 455/555 Structural Damage, Rehabilitation, and Repair
CE 457/557 Environmental Degradation of Concrete Structures
ME 310 Thermodynamic System Engineering
ME 411 Introduction to Heat Transfer
ME 444 Computer Aided Engineering
CE 438 or CE 538 Finite Element Methods
CE 486/586 Intro to Industrial Ecology
EHS 406 Industrial Hygiene Control Methods

Or other course as designated by CEE Department Chair

Construction Engineering Management
CE 411 Construction Materials
CE 415/515 Foundation Design
CE 441 Concrete Design
CE 442 Steel Design

at least two of the following CE courses:

<table>
<thead>
<tr>
<th>CE 405 Construction Planning</th>
<th>CE 409 Fund. Of Building Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 406 Construction Engineering</td>
<td>CE 410/510 Sustainable Infrastructure and Building</td>
</tr>
<tr>
<td>CE 407 Construction Estimating and Scheduling</td>
<td>CE 445 Timber Design</td>
</tr>
<tr>
<td>CE 408 BIM/IPD</td>
<td>CE 446 Masonry Design</td>
</tr>
</tbody>
</table>

at least two of the following non-CE courses:

<table>
<thead>
<tr>
<th>OS 446 Negotiations &amp; Relationship Management</th>
<th>EHS 330 Safety Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 361 Financial Management</td>
<td>LW 270 Law &amp; Society 1</td>
</tr>
<tr>
<td>EM/OM 451 Quality Management &amp; Lean Enterprise</td>
<td>LW 446 Law of the Work Place</td>
</tr>
<tr>
<td>EM/OM 380 Project Management</td>
<td>COMM 417 Business &amp; Professional Speaking</td>
</tr>
</tbody>
</table>

Structural Engineering
CE 420/520 Advanced Structural Analysis
CE 415/515 Foundations Design
CE 441 Reinforced Concrete Design
CE 442 Steel Design
CE 490 or CE 492 Senior Design

Choose at least TWO of the following

<table>
<thead>
<tr>
<th>CE 401/501 Fracture Mechanics of Concrete Structures</th>
<th>CE 455/555 Structural Damage, Rehabilitation, and Repair</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 411 Construction Materials</td>
<td>CE 438 or CE 538 Finite Element Methods</td>
</tr>
<tr>
<td>CE 421/521 Composite Mechanics and Design</td>
<td>CE 444/544 Advanced Concrete Design</td>
</tr>
<tr>
<td>CE 453/553 Properties and Performance of Concrete Materials</td>
<td>CE 457/557 Environmental Degradation of Concrete Structures</td>
</tr>
<tr>
<td>ME 444 Computer Aided Engineering</td>
<td>CE 512 Fundamentals of Dynamics and Vibrations</td>
</tr>
</tbody>
</table>

Environmental Engineering
Choose one of:
CE340 Introduction to Environmental Engineering
CH220 Chemical Engineering Principles II: Material Balances

Choose one of:
CH210 Chemical Engineering Principles I: Material Balances
CM241 Organic Chemistry I
CM371 Physical Chemistry I

Choose one of:
BY222 Ecology and BY224 Ecology Laboratory
BY240 Environmental Science and Policy of American Rivers
BY320 Microbiology

Choose one of:
CE491 Senior (Water Resources/Environmental) Design
MP401 Multidisciplinary Course (Environmental Remediation Design)

Plus any two courses from the following:

<table>
<thead>
<tr>
<th>Course 1</th>
<th>Course 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE430 Water Resources Engineering II</td>
<td>CE486 Industrial Ecology</td>
</tr>
<tr>
<td>CE435 Groundwater Hydrology and Geochemistry</td>
<td>CE580 Environmental Chemistry</td>
</tr>
<tr>
<td>CE477 Atmospheric Chemistry</td>
<td>CE584 Chemodynamics</td>
</tr>
<tr>
<td>CE478 Solid Waste Management and Landfill Design</td>
<td>BY531 Limnology and BY532 Limnology Laboratory</td>
</tr>
<tr>
<td>CE479 Water and Wastewater Treatment Processes</td>
<td>CH434/ES434 Air Pollution Control</td>
</tr>
<tr>
<td>CE480 Chemical Fate and Transport in the Environ</td>
<td>ES436 Global Climate Change: Science, Eng &amp; Policy</td>
</tr>
<tr>
<td>CE481 Hazardous Waste Management Engineering</td>
<td>ES464 Corrosion Engineering</td>
</tr>
<tr>
<td>CE482 Environmental Systems Analysis Design</td>
<td></td>
</tr>
<tr>
<td>EHS406 Industrial Hygiene Control Methods or</td>
<td>EHS416 Principles of Toxicology and Epidemiology</td>
</tr>
</tbody>
</table>

Standard Length of BS in Civil Engineering - Four years or eight semesters
BS in Computer Engineering

The objective of the undergraduate program in computer engineering is to prepare students for careers as professional engineers and to provide a base for graduate study and for lifelong learning in new and developing specialties. We expect that within a few years after completing the program our graduates will become:

1. Contributing Professionals
Graduates are expected to have advanced their careers as professionals who apply fundamental engineering knowledge and analytical problem solving skills in a wide variety of practical applications.

2. Well-Rounded Citizens
Graduates are expected to have become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

3. Effective and Responsible Collaborators
Graduates are expected to have become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field.

4. Intellectual Growth
Graduates are expected to have exhibited intellectual growth and pursue continual innovation in their field. Those graduates who are motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The degree program in computer engineering fosters the achievement of these objectives in two ways. First, the curriculum as a whole is comprised of:

- a coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment;
- education in the humanities, social sciences, ethical principles and management, with special attention to the development of effective written and oral communication skills;
- elective coursework in several of the major subdisciplines of electrical, computer and software engineering, to encourage the pursuit of individual interests and to provide opportunity to gain further knowledge in these subdisciplines; and
- experiences that facilitate the development of problem-solving, teamwork and engineering design skills with the aid of modern analysis and design tools, and experiences that encourage students to become active alumni and to develop a commitment to lifelong learning.

Basic and required courses are taken during the first two years, along with some introductory professional courses, including an engineering laboratory. Laboratory courses are required in both of these years with a strong emphasis on engineering design. The third and fourth years include both required and elective technical courses.

The Clarkson Common Experience is addressed in the first year with the Clarkson Seminar and ES110 Engineering and Society. Five knowledge area courses including a university course are required over the four years of study. One of these knowledge area courses must be in economics and one must be ES110. The Clarkson Common Experience is designed, in part, to develop communication, problem-solving, and
critical-thinking skills and an understanding of the social, ethical and economic implications of an engineer’s work.

Second, the computer engineering program is constructed so that each student develops a working knowledge of engineering design based on a broad spectrum of concepts, principles, and techniques balanced in hardware, software, and systems, along with a strong set of communication and teamwork skills. This is done through a program of study with the following characteristics:

- In the required courses, students are expected to master fundamentals of hardware and software design. Sound software engineering principles are introduced and reinforced with required courses that treat object-oriented design, data structures, standardized components, and system software. Hardware design principles are introduced in a course that treats hardware concepts and analysis that is followed by work in logic design and laboratory experiences in which students must design and build small systems using standard logic circuits and programmable logic devices. Elements common to hardware and software are stressed and hardware/software tradeoffs are addressed in this segment of the curriculum.

- Students gain experience working in modern software development environments and using modern design tools. In the required course sequence, students learn C/C++ and Java in the context of modern integrated development environments, gain experience with Hardware Description Languages (HDL) and industry standard simulation, synthesis, debug and verification tools for FPGA hardware design in their design projects.

- Students develop their teamwork and communication skills. They do so in part through course work that requires them to communicate effectively in written form and in part through course work involving team-based design, written communication of their design decisions, and oral presentation of their work. The design experiences require that students work in teams of varying size, collaborating with others on teams whose composition is determined by their instructors. By participating in team-based problem solving of this kind, with individuals whom they did not choose as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills.

- Students develop the ability to design an integrated hardware/software system to meet desired specifications. They engage in a major design experience that emulates an industrial design environment. In this design experience, students design and implement the hardware and software components of a digital system. This team-oriented task demands that students learn to work with others in completing a system design that meets specifications on time. The system specifications often require that students interact with individuals from other disciplines to design an acceptable product.

- Students engage in activities that foster an appreciation for the importance of extracurricular and community involvement. They are actively encouraged to become involved with professional societies, service organizations, and other extracurricular activities and also to take advantage of the close interpersonal environment that the department fosters. We require our students to obtain professional experience prior to graduation, either through an internship or by participating in the co-op program. Further, we encourage our students to participate in engineering projects on campus, through undergraduate research, suitable on-campus work experience, and technical extracurricular activities such as the US First Robotics competition.
### Computer Engineering Curriculum

**FIRST YEAR**  
(See Common First-Year Curriculum in Engineering)

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA232</td>
<td>Differential Equations</td>
<td>3</td>
<td>MA231</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
<td>EE211</td>
<td>ECE Lab I</td>
<td>3</td>
</tr>
<tr>
<td>ES Elective$^5$</td>
<td></td>
<td>3</td>
<td>EE221</td>
<td>Linear Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EE261</td>
<td>Intro to Programming and Software Design</td>
<td>3</td>
<td>EE264</td>
<td>Intro to Digital Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EE361</td>
<td>Fundamentals of Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>KA/UC Elective$^1$</td>
<td></td>
<td>3</td>
<td></td>
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</table>

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE321</td>
<td>Systems and Signal Processing</td>
<td>3</td>
<td>EE316</td>
<td>Computer Engineering</td>
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<tr>
<td>EE341</td>
<td>Microelectronics</td>
<td>3</td>
<td>EE360</td>
<td>Microprocessors</td>
<td>3</td>
</tr>
<tr>
<td>EE363</td>
<td>Generic Programming &amp; Software Components</td>
<td>3</td>
<td>EE462</td>
<td>Software Systems Architecture</td>
<td>3</td>
</tr>
<tr>
<td>EE365</td>
<td>Advanced Digital Circuit Design</td>
<td>3</td>
<td>MA211</td>
<td>Foundations</td>
<td>3</td>
</tr>
<tr>
<td>STAT383</td>
<td>Probability and Statistics</td>
<td>3</td>
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**SENIOR YEAR**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
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<tr>
<td>EE416</td>
<td>Computer Eng.</td>
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<tr>
<td></td>
<td>Senior Lab</td>
<td>3</td>
<td></td>
<td>KA/UC Elective$^1$</td>
<td>3</td>
</tr>
<tr>
<td>EE464</td>
<td>Digital Systems Design</td>
<td>3</td>
<td></td>
<td>Undesignated</td>
<td></td>
</tr>
</tbody>
</table>
Knowledge Area or University Course Electives
There are a total of five courses which must be taken to cover at least four knowledge areas. At least one of these courses must be a University course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an economics course, EC350 is recommended, and one must be ES110.

The Computer Science Elective must be selected from computer science courses numbered 300 or higher or CS 242.

The Professional Electives are ECE courses numbered 300 or higher, or other engineering course if approved by the ECE Department.

The Undesignated Electives are fulfilled by college level courses that do not contain a significant amount of material already covered elsewhere in the student's program.

The Engineering Science Elective is satisfied by the selection of an ES course approved by the ECE Department.

See Academic Requirements for details of the Clarkson Common Experience including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements and professional experience.

Professional Specializations
The courses offered by the Department of Electrical and Computer Engineering can be grouped into subdisciplines, with each subdiscipline including a combination of required and elective courses at the undergraduate level. Note that a number of these courses cross subdiscipline boundaries. A complete description of all courses can be found online on the Student Administrative Services website. Qualified undergraduate students are encouraged to take graduate level courses within their area of interest. Undergraduate students enrolled in 500-level courses must have a cumulative grade-point average of at least 3.0, and permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have a cumulative grade-point average of at least 3.5, and must have permission of their advisor, department chair, and the dean of Engineering. See Professional Concentrations in Engineering.
BIOMEDICAL ENGINEERING
BR400  Introduction to Biomedical Rehabilitation Engineering and Science
EE485  Neural Engineering

COMMUNICATIONS SYSTEMS AND SIGNAL PROCESSING
EE401  Digital Signal Processing
EE404  Wireless Networks
EE407  Computer Networks
EE427  Introduction to Digital Image Processing
EE470  Coding and Information Transmission
EE471  Principles of Digital and Data Communications

COMPUTER ENGINEERING
EE360  Microprocessors
EE361  Fundamentals of Software Engineering
EE363  Software Components and Generic Programming
EE365  Advanced Digital Circuit Design
EE368  Software Engineering
EE404  Wireless Networks
EE407  Computer Networks
EE408  Software Design for Visual Environments
EE410  Computer and Network Security
EE461  Many-Core Architecture and Programming Model
EE462  Software Systems Architecture
EE464  Digital System Design
EE465  Computer Graphics
EE466  Computer Architecture
EE468  Database Systems

CONTROL SYSTEMS
EE450  Control Systems
EE451  Digital Control
EE452  Optimization Techniques in Engineering

ELECTRONICS AND CIRCUITS
EE345  Microelectronic Circuit Fabrication
EE441  Electronic Devices for IC Simulation
EE442  CMOS IC Design
EE446  Instrumentation
EE447  VLSI Design
EE448  Solar Cells
EE449  Fundamental of Antenna Engineering

POWER ENGINEERING
EE333  Power System Engineering
EE430  High-voltage Techniques and Measurements
EE431  Power Distribution and Utilization
EE436  Electric Machines and Drives
EE438  Alternate Energy Systems
EE439  Dielectrics
BS in Electrical Engineering

The objective of the undergraduate program in electrical engineering is to prepare students for careers as professional engineers and to provide a base for graduate study and lifelong learning in new and developing specialties. We expect that within a few years after completing the program our graduates will become:

1. Contributing Professionals
Graduates are expected to have advanced their career as professionals who apply fundamental engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

2. Well-Rounded Citizens
Graduates are expected to have become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

3. Effective and Responsible Collaborators
Graduates are expected to have become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field.

4. Intellectual Growth
Graduates are expected to have exhibited intellectual growth and pursue continual innovation in their field. Those graduates who are motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The degree program in electrical engineering fosters the achievement of these objectives in two ways. First, the curriculum as a whole is comprised of:

- a coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment;
- education in the humanities, social sciences, ethical principles and management, with special attention given to the development of effective written and oral communication skills;
- elective coursework in several of the major subdisciplines of electrical and computer engineering, to encourage the pursuit of individual interests and to provide opportunity to gain further knowledge in these subdisciplines;
- experiences that facilitate the development of problem solving, teamwork, and engineering design skills with the aid of modern analysis and design tools; and
- experiences that encourage students to become active alumni and to develop a commitment to lifelong learning.

Basic and required courses are taken during the first two years, along with some introductory professional courses, including an engineering laboratory. The third and fourth years include both required and elective technical courses.

The Clarkson Common Experience is addressed in the first year with the Clarkson Seminar and ES110 Engineering and Society. Five knowledge area courses including a university course are required over the four years of study. One of these knowledge area courses must be in economics and one must be ES110. The Clarkson Common Experience is designed, in part, to develop communication, problem-solving, and critical-thinking skills and an understanding of the social, ethical and economic implications of an engineer’s work.
Second, the electrical engineering program is constructed so that each student develops depth of knowledge in the discipline that is built upon mastery of material in fundamental required courses, a base of experience using state of the art software and engineering tools, the ability to design an engineering system to meet desired specifications, and the ability to communicate effectively and work as a member of an engineering team. This is done through a program of study with the following characteristics:

- In the initial required courses, students are expected to master the essential topics that are needed in the courses that follow. In these courses, students are expected to gain a firm grounding in basic electrical and computer engineering (reinforced with laboratory experience) and then take a set of intermediate courses that treat topics in systems and signal processing energy conversion, electromagnetic fields, and microelectronics. Each student then develops his or her own interests further by taking a pair of advanced courses in a chosen area of the discipline to gain depth in that area while also taking courses in other areas of the discipline to ensure breadth of coverage.

- Students gain experience in using state-of-the-art software and engineering tools. They encounter C/C++ programming, MATLAB, FPGA design and simulation tools, and Pspice early in their program of study and continue to use these methods throughout many of their required courses. Students develop their teamwork and communication skills. They do so in part through course work that requires them to communicate effectively in written form and in part through course work involving team-based design, written communication of their design decisions, and oral presentation of their work. The design experiences require that students work in teams of varying size. By participating in team-based problem solving of this kind, with individuals whom they may not have chosen as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills.

- Students develop the ability to design an engineering system to meet desired specifications. They engage in a major design experience in which they design and build an engineering system. The specific type of system varies, as projects are chosen from various application areas relevant to the discipline. These team-oriented tasks demand that students learn to work with others in completing a system design that meets specifications on time. The system specifications may require that students interact with individuals from other disciplines to design an acceptable product.

- Students engage in activities that foster an appreciation for the importance of extracurricular and community involvement. They are actively encouraged to become involved with professional societies, service organizations, and other extracurricular activities and also to take advantage of the close interpersonal environment that the department fosters. We require our students to obtain professional experience prior to graduation, either through an internship or by participating in the co-op program. Additionally, we encourage our students to participate in engineering projects on campus, through undergraduate research, suitable on-campus work experience, and technical extracurricular activities such as the US First Robotics competition.
## Electrical Engineering Curriculum

### FIRST YEAR
*(See Common First-Year Curriculum in Engineering)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA232</td>
<td>Differential Equations</td>
<td>3</td>
<td>MA231</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>ES250</td>
<td>Electrical Science</td>
<td>3</td>
<td>EE211</td>
<td>ECE Lab I</td>
<td>3</td>
</tr>
<tr>
<td>ES Elective⁴</td>
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<td>3</td>
<td>EE221</td>
<td>Linear Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EE261</td>
<td>Intro to Programming and</td>
<td>3</td>
<td>EE264</td>
<td>Intro to Digital Design</td>
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<tr>
<td>Software Design</td>
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<td>Dynamical Systems</td>
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<tr>
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15

### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>STAT383</td>
<td>Probability and Statistics</td>
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<td>EE381</td>
<td>Electromagnetic Fields</td>
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<tr>
<td>EE311</td>
<td>EE Junior Lab</td>
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<td>and Waves</td>
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<td>EE321</td>
<td>Systems and Signal Processing</td>
<td>3</td>
<td>Math Elective³</td>
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<td>EE331</td>
<td>Energy Conversion</td>
<td>3</td>
<td>Area Electives²</td>
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<td>EE341</td>
<td>Microelectronics</td>
<td>3</td>
<td>KA/UC Elective¹</td>
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### JUNIOR YEAR

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<th>Course</th>
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<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EE412</td>
<td>EE Senior Design or</td>
<td>3</td>
<td>Area Elective²</td>
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<tr>
<td>Area Elective³</td>
<td></td>
<td>3</td>
<td>or</td>
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<tr>
<td>ES Elective⁴</td>
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<td>EE412</td>
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<td>Undesignated Electives⁵</td>
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</table>

15

### SENIOR YEAR

1 Knowledge Area or University Course electives.

There are a total of five courses which must be taken to cover at least four knowledge areas. At least one of these courses must be a University course. University courses are interdisciplinary courses that cover two
or more knowledge areas. One of the knowledge area electives must be an Economics course, EC350 is recommended and one must be ES110.

² There are six Area Electives which must be selected as follows: At least two from a single area of concentration within the electrical and computer engineering discipline, and one from a different area of electrical and computer engineering. The remainder may be chosen in any combination from any of the areas of electrical and computer engineering. A list of appropriate courses within those areas is available from the ECE Department and is contained in the ECE Undergraduate Student Handbook.

³The Mathematics Elective may be MA211 or numbered 300 level or higher and must include a significant amount of mathematical theory.

⁴The Engineering Science Electives are satisfied by ES courses approved by the ECE Department.

⁵The Undesignated Electives are fulfilled by college level courses that do not contain a significant amount of material already covered elsewhere in the student's program.

See Academic Requirements for details of the Clarkson Common Experience including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), Professional Experience, and related requirements.

Professional Specializations
The courses offered by the Department of Electrical and Computer Engineering can be grouped into subdisciplines, with each subdiscipline including a combination of required and elective courses at the undergraduate level. A complete description of all courses can be found online on the Student Administrative Services website. Undergraduate students enrolled in 500-level courses must have a cumulative grade-point average of at least 3.0, and permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have senior standing, a grade-point average of at least 3.5, and must have permission of their advisor, department chair, and the Dean of Engineering. See Professional Concentrations in Engineering.

BIOMEDICAL ENGINEERING
BR400  Introduction to Biomedical Rehabilitation Engineering and Science
EE485  Neural Engineering

COMMUNICATIONS SYSTEMS AND SIGNAL PROCESSING
EE401  Digital Signal Processing
EE404  Wireless Networks
EE407  Computer Networks
EE427  Introduction to Digital Image Processing
EE470  Coding and Information Transmission
EE471  Principles of Digital and Data Communications

CONTROL SYSTEMS
EE450  Control Systems
EE451  Digital Control
EE452  Optimization Techniques in Engineering

ELECTRONICS AND CIRCUITS
EE345  Microelectronic Circuit Fabrication
EE441  Electronic Devices for IC Simulation
EE442  CMOS IC Design
EE446  Instrumentation
EE447  VLSI Design
EE448  Solar Cells
COMPUTER ENGINEERING
EE360  Microprocessors
EE361  Fundamentals of Software Engineering
EE363  Software Components and Generic Programming
EE365  Advanced Digital Circuit Design
EE368  Software Engineering
EE404  Wireless Networks
EE407  Computer Networks
EE408  Software Design for Visual Environments
EE410  Computer and Network Security
EE461  Many-Core Architecture and Programming Model
EE462  Software Systems Architecture
EE464  Digital System Design

EE449  Fundamental of Antenna Engineering

POWER ENGINEERING
EE333  Power System Engineering
EE430  High-voltage Techniques and Measurements
EE431  Power Distribution and Utilization
EE436  Electric Machines and Drives
EE438  Alternate Energy Systems
EE439  Dielectrics
BS in Environmental Engineering
Environmental engineers provide the knowledge, leadership, and guidance needed to improve the quality and insure the sustainability of our natural world — from the water we drink, to the air we breathe, to the soil that produces our life-sustaining vegetation. Environmental engineers play a major — and increasingly proactive — role in prevention and control of pollution of all kinds and in efforts to deal with global warming.

Environmental engineers develop and implement technologies to solve problems like meeting clean water supply needs and protecting public health, addressing the air pollution issues of acid rain and global warming, and reducing pollution while maintaining and improving the quality of life we enjoy.

The mission of the Civil and Environmental Engineering Department, formally stated, is to educate talented and motivated men and women to become successful professionals through quality undergraduate and graduate programs that place a high priority on student access and interaction with faculty. This mission statement establishes the educational framework for the environmental engineering degree program at Clarkson, and the curriculum objectives given below provide more detail about the program.

Curriculum Objectives
The Environmental Curriculum is designed for a career in environmental research, system modeling, or process design. All Environmental Engineering majors are provided with a theoretical foundation as well as design experience in the area of water resources, environmental quality, systems, hazards and treatment processes. This foundation is typically achieved in the junior year and enables students to use the senior year to select elective courses in areas where their particular interests have developed. In the senior year a capstone design course culminates the development of design skills.

The BSEnvE degree (Bachelor of Science in Environmental Engineering) program objectives may be stated as shown below:

- Develop students whose engineering knowledge can meet the challenges of a successful professional career.
- Ensure students acquire good communication and leadership skills.
- Foster an intellectually stimulating environment for professional development.
- Develop a relationship between students and faculty that produces a personal interest in the student’s education and professional development.

Moreover, the approach to the achievement of these objectives may be summarized as:

- offering a quality undergraduate program that places a high priority on student access and faculty interaction within an environment that is intellectually stimulating and encourages professional development;
- providing its graduates with the engineering knowledge needed to meet the lifelong challenges of a successful professional career; and
- valuing good communication and leadership skills.

It is expected that graduates from the BSEnvE program will demonstrate achievement of these objectives within a few years after completing the program.
Science and engineering-science courses form the majority of the curriculum in the first two years. These courses provide the base for the professionally oriented courses in the junior and senior years. Through the selection of electives, students can take courses in an area of environmental engineering that is not covered by required courses, such as Air Pollution Control and Industrial Hygiene. Courses acceptable as professional electives are listed under Professional Concentrations in Engineering. The Environmental Engineering curriculum provides for six professional electives. These electives courses enable students to create programs of study unique to each individual as well as provide both depth and breadth in the student’s preparation for professional practice. In the senior year a capstone design course culminates the development of design skills that were first introduced in the sophomore year and enhanced in subsequent courses. The guiding principle is that the student and faculty advisor together create a program of study that best satisfies the student’s individual career objectives.

### Environmental Engineering Curriculum

#### FIRST YEAR
(See Common First-Year Curriculum in Engineering)

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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<td>ES220</td>
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<td>CE340</td>
<td>Environmental Eng. (S)</td>
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<tr>
<td>CE212</td>
<td>Intro Eng. Design (F)</td>
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<td>CE380</td>
<td>Fundamentals of Environmental Eng w/lab (S)</td>
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<td>MA232</td>
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#### JUNIOR YEAR

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<tr>
<td>STAT383</td>
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<td>Thermodynamics</td>
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<tr>
<td>CM241</td>
<td>Organic Chemistry (F) or CM221 Spectroscopy (F)</td>
<td>3</td>
<td>CE301</td>
<td>Geospatial Science</td>
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<tr>
<td>CE330</td>
<td>Water Resources w/lab (F)</td>
<td>3</td>
<td>BY320</td>
<td>Microbiology</td>
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</table>
CE479 Water & Wastewater Treatment
Core Professional Elective 3
KA/UC Elective 3

15

## SENIOR YEAR

<table>
<thead>
<tr>
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<th>Cr. Hrs.</th>
<th>Course</th>
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<th>Cr. Hrs.</th>
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<td>Engineering Economics</td>
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</tr>
</tbody>
</table>

Core Professional Courses **must** include three of these courses:

- CE482/582 Systems (3)
- CE486 Ind Ecology (1)
- ES432 Risk Analysis
- CE481 Haz Waste

Earth Science Elective must be one of: CE435/535 Groundwater Hydrology and Geochemistry; CE315 Geology for Engineers (1), ES426 Global Climate Change: Science, Engineering and Policy (odd springs), CE477 Atmospheric Chemistry (even springs)

Four courses (12 credits) of the Professional Electives must be in Engineering Topics.
A total of 16.5 design credits are required to be accumulated. Required courses provide 9 or 10 design credits.

**Standard Length of BS in Environmental Engineering**
Four years or eight semesters
BS in Mechanical Engineering

The objectives of the Mechanical Engineering program are that graduates:

1. Will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of electromechanical systems and understand the social, ethical, and environmental context of their work;
2. Will communicate clearly, collaborate competently in teams, and assume leadership roles;
3. Will have the habit of continuous professional development.

The program outcomes are the generic abilities that graduates will demonstrate that they have acquired. The defining characteristics of professional problems\(^1\) and the process used to solve them lead directly to these generic program outcomes.

- An ability to apply knowledge of mathematics, science, and engineering, and an ability to design and conduct experiments, as well as analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, and an ability to function on multidisciplinary teams.
- An ability to identify, formulate, and solve engineering problems, and an understanding of professional and ethical responsibility.
- An ability to communicate effectively, and the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context.
- A recognition of the need for, and an ability to engage in life-long learning, and a knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The Mechanical engineering program expects the student to graduate with the ability to: apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations) to model, analyze, design, and realize physical systems, components or processes; and work professionally in both thermal and electromechanical systems.

Curriculum Overview: The 120-credit program contains 84 credit hours of required technical courses, 36 credit hours of electives (including two professional electives, two undesignated electives and five Knowledge Area/University Course, KA/UC, electives).

Required Technical Courses: The first two years of the curriculum cover mathematics, physics, chemistry and engineering science courses (including basic principles of statics, dynamics, solid mechanics, electrical circuits, materials and the use of computers).

In the third and fourth years, students take specialized courses on topics such as fluid mechanics and mechanical vibrations and control. These courses provide knowledge and skills that strongly support the second outcome listed above, which is a key element in thermo-mechanical systems design. The laboratory components of the first-year physics and chemistry courses introduce study of the relationship between theory and reality. This fosters the development of the student’s technical intuition. Mechanical engineering laboratory courses add to this development.
Training in professional problem-solving begins in the spring of the second year, with the first course in engineering design. The first course to train students formally in the solution process, it lays the foundation for the fourth-year capstone design course. In the capstone course, students work in teams to design and evaluate thermo-mechanical systems that meet real needs. Thus, they learn to apply the solution process to a real professional problem. Students may acquire additional professional experience by participating in Formula SAE, Mini-Baja, Clean Snowmobile, or other team competitions, which are open to any student.

Common Curriculum Requirements: Plans of study must include a total of five Knowledge Area (KA) courses. Students will select these so that at least one is a designated University Course, and so that together these five courses cover the four knowledge areas. Communication intensive course requirement will be fulfilled by a combination of courses having one or two communication points each, with a total of six points required for graduation. At least two of these six points will be earned through 300- or 400-level courses required in the major.

Professional and Undesignated Electives: The professional electives must be advanced-level courses chosen according to criteria in the Mechanical & Aeronautical Engineering (MAE) Department Student Handbook. However, the two undesignated electives may be any college-level courses that do not contain a significant amount of material already covered in other courses. They could be chosen to enrich the student’s technical or nontechnical background. Advanced (200-level or above) Aerospace Studies or Military Science courses may be used as undesignated electives.

Mechanical Engineering Curriculum

FIRST YEAR
(See Common First-Year Curriculum in Engineering)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>Title</td>
</tr>
<tr>
<td>MS/AS</td>
<td>Military Science/Aerospace Studies (if elected)</td>
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SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>Title</td>
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<tr>
<td>ES220</td>
<td>Statics</td>
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<tr>
<td>ES250</td>
<td>Electrical Science</td>
</tr>
<tr>
<td>ES260</td>
<td>Materials Science</td>
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<tr>
<td>KA/UC Elective</td>
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</tr>
</tbody>
</table>

16 | 16
**Specializations**
Students may select electives from one or more of the following categories. Not all courses are offered each year or each semester. Courses required for the aeronautical engineering degree are offered on a regular basis and may be taken by mechanical engineering students as electives.

### COMPUTER APPLICATIONS
- ME428 Computational Fluid Mechanics
- ME443 Optimal Engineering
- ME444 Computer-Aided Engineering

### FLUID AND THERMAL SCIENCES
- AE/ME425 Aerodynamics
- AE/ME442 Design of Propulsion Systems
- AE/ME431 Gas Dynamics
- ME437 Particle Transport, Deposition, and Removal I

### MATERIALS AND MANUFACTURING
- ME492 Welding Metallurgy
- ME452 Advanced Strength of Materials
- ME455 Mechanical Vibrations and Control
- ME457 Composite Mechanics and Design
- OM480 Project Management

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**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
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<tr>
<td>Course</td>
<td>Title</td>
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<tr>
<td>ES330</td>
<td>Fluid Mechanics</td>
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<td>ES340</td>
<td>Thermodynamics</td>
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<td>ME324</td>
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<td>ME301</td>
<td>Mech. Engineer. Lab II</td>
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<tr>
<td>ME310</td>
<td>Thermody. Sys. Eng.</td>
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**SENIOR YEAR**

<table>
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<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td>Course</td>
<td>Title</td>
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<td>ME442</td>
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<tr>
<td>ME445</td>
<td>Integrated Design I</td>
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<td>AE, ES, or ME Prof. Elective</td>
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<td>Professional Elective</td>
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<tr>
<td></td>
<td>Undesignated Elective</td>
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</table>

**Or MAY MA331 and STAT383**
BS in Software Engineering
The discipline of software engineering is concerned with the application of engineering principles to the construction of computer software. It addresses critical issues across the life cycle of a software product, beginning with a proposal to develop an application that requires computing resources and continuing through the development, testing, operation, and maintenance of the software product until it is retired.

The software engineer plays the role of the architect of a complex system. He or she takes into account the user requirements and needs, feasibility, cost, quality, reliability, safety, and time constraints. To do this, the software engineer has to be able to understand the application area that is the target of the desired software system, develop the software and ensure that it is reliable, and also manage the project so that it is produced in an economical, timely manner.

Objectives of the Clarkson Software Engineering Program
Software engineering graduates should be well prepared for a lifetime of professional activity, and the objective of our program is to build a foundation on which graduates can build successful careers. This means that, within a few years after completing the program, we expect that our graduates will be contributing professionals, effective and responsible collaborators. They should also have continued to grow intellectually and as well rounded citizens. This means graduates are expected to have

- advanced their careers as contributing professionals who apply fundamental engineering knowledge and analytical problem solving skills in a wide variety of practical applications
- become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities
- become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field
- exhibited intellectual growth and pursued continual innovation in their field. Those graduates who are especially talented and motivated to pursue a graduate degree should be successful at entering and completing graduate studies

To attain these objectives, the curriculum is structured so that when a student graduates from the Software Engineering program, he or she will have gained the knowledge, skills, and attributes that provide a foundation on which a successful career in the Software Engineering profession rests. Our graduates will attain the following student outcome:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

In the context of the software engineering discipline, this means that graduates of the program will:

- have a fundamental understanding of computer systems
- be able to apply engineering principles to software design and construction, having developed the ability to:
  - develop software requirements and functional specifications
  - use proven techniques to design software structure before it is implemented
  - apply established verification and validation techniques
  - understand the importance of constructing large software systems using standardized components and reusing existing code (modules) where possible,
  - use software tools as effective aids in all phases of software development
  - design, develop, and deliver software in a cost effective manner
- have experience with issues encountered at every stage in the software life-cycle
- be able to work on an interdisciplinary team of software components of a system
- have good interpersonal and communication skills
- be able to readily assimilate new technologies
- understand the impact their discipline has on society

Curriculum
To accomplish these goals, the curriculum is structured around a group of required courses in science, mathematics, computer science, and engineering. A variety of courses in the engineering sciences are included in the curriculum in order to provide exposure to application areas. Although there is ample opportunity for students to participate in team-based activities throughout the curriculum, each student’s program of study includes a major design experience in the senior year in which the student is required to bring together knowledge gained in a wide variety of courses to solve realistic problems, building significant applications in a team-based environment.

An Interdisciplinary Approach
Software Engineering is distinctive at Clarkson because it is interdisciplinary: we combine the expertise, knowledge, and experience of faculty from both the Electrical and Computer Engineering and the Mathematics and Computer Science Departments. That benefits the students because they master the application of theory as well as knowledge and understanding of processes software process as they gain the ability to develop effective and cost-efficient software systems. Clarkson’s program is also designed to help students build interpersonal and communication skills that can launch a successful career in today’s world.

Software Engineering Curriculum

FIRST YEAR
(See Common First-Year Curriculum in Engineering)
<table>
<thead>
<tr>
<th>Course</th>
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<th>Cr. Hrs.</th>
<th>Course</th>
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<th>Cr. Hrs.</th>
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<tr>
<td>MA232</td>
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<td>MA231</td>
<td>Calculus III</td>
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<td>MA211</td>
<td>Foundations</td>
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<td>EE264</td>
<td>Intro. to Digital Design</td>
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<td>ES250</td>
<td>Electrical Science</td>
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<td>EE361</td>
<td>Fundamentals of Software Engineering</td>
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<td>EE261</td>
<td>Intro. to Programming and Software Design</td>
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<td>EE221</td>
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**SOPHOMORE YEAR**

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<td>CS344</td>
<td>Algorithms and Data Structures</td>
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<td>MA381</td>
<td>Probability</td>
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<td>Microprocessors</td>
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<td>Computer Networks</td>
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<td>EE368</td>
<td>Software Engineering</td>
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<td>EE462</td>
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<td>Database Systems</td>
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**JUNIOR YEAR**

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<td>KA/UC Elective</td>
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<td>15</td>
</tr>
</tbody>
</table>

**SENIOR YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
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<tbody>
<tr>
<td>EE418</td>
<td>Senior Design</td>
<td>3</td>
<td>CS444</td>
<td>Operating Systems</td>
<td>3</td>
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<tr>
<td>EE466</td>
<td>Computer Architecture</td>
<td>3</td>
<td>CS458</td>
<td>Formal Methods for Program Verification</td>
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<tr>
<td>CS341</td>
<td>Programming Languages</td>
<td>3</td>
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<tr>
<td></td>
<td>Professional Elective</td>
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<td></td>
<td>KA/UC Elective</td>
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<td>15</td>
</tr>
</tbody>
</table>

* One of the KA/UC electives must be in economics.
Undergraduate Minors in Engineering

Minor in Biomedical Engineering
As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minor in Biomedical Engineering enhances opportunities for Clarkson's students to meet this need. This minor is connected closely with the minor in Biomedical Science and Technology. Students from both minors participate in shared core courses along with a multidisciplinary capstone design course. **Students can take only one (not both) of the two minors.**

A foundation knowledge of Calculus I & II (MA131/132), Physics I & II (PH131/132), and Biology II: Cell and Molecular Biology (BY160) is required for this minor.

Requirements:
**Physiology/Anatomy Requirement**
BY471 Anatomy and Physiology I  
BY473 Anatomy and Physiology I Laboratory  
OR  
BYBY472 Anatomy and Physiology II  
BY474 Anatomy and Physiology II Laboratory  
OR  
BY360 Human Physiology  
BY362 Human Physiology Laboratory  
BR200 Introduction to Biomedical and Rehabilitation Engineering, Science and Technology  
BR450 Biomedical Engineering, Science, and Technology Capstone Design I or equivalent engineering design course with a BEST approved project  
BR400 Biomedical Engineering  
**Engineering Depth Elective**  
Choose 1 (3 credits) from approved list of upper division courses.  
**Breadth Elective**  
Choose 1 (3 credits) from approved list of upper division courses.
Minor in Biomedical Science and Technology

As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minor in Biomedical Science and Technology enhances opportunities for Clarkson's students to meet this need. This minor is connected closely with the minor in Biomedical Engineering. Students from both minors participate in shared core courses along with a multidisciplinary capstone design course. **Students can take only one (not both) of the two minors.**

A foundation knowledge of Biology II: Cell and Molecular Biology (BY160) is required for this minor.

**Biology Fundamentals: Required (4 credits):**

**Physiology/Anatomy Requirement**
BY471 Anatomy and Physiology I  
BY473 Anatomy and Physiology I Laboratory  
OR  
BY472 Anatomy and Physiology II  
BY474 Anatomy and Physiology II Laboratory  
OR  
BY360 Human Physiology  
BY362 Human Physiology Laboratory

**Engineering Fundamentals (3 credits)**
BR200 Introduction to Biomedical and Rehabilitation Engineering, Science and Technology

**Intersecting BEST courses, Required (3 credits)**
*(team taught, interdisciplinary)*  
BR450 BEST Capstone Design I (3 credits) or equivalent engineering design course with a BEST approved project

**Specialty Tracks:**
Choose one (2 course - 6 credits) track

**Track I Genetic Engineering**
BY214 Genetics  
And choose one of  
BY412 Molecular Biology Laboratory (4 credits)  
BY/CM314 Bioinformatics

**Track II Kinesiology**
PT360: Kinesiology I - Concepts of Human Movement  
PT460: Kinesiology II - Functional Anatomy (PT360)

**Track III Neuroscience**
BY/CM460 Neurobiology (BY160 or BY360 or consent)  
PY458 Cognitive Neuroscience (PY151 or junior/senior standing)
Breadth Elective:
Choose 1 (3 credits) from approved list of upper division courses

Total: 19 credits (plus the 3 credits cell biology)

Minor in Electrical Engineering
A minor in Electrical Engineering is available to students in any degree program. To obtain the Electrical Engineering minor, a student must complete the four required courses and two of the six elective courses from the following list:

Required Courses: 4

- EE331 Energy Conversion
- EE381 Electromagnetic Fields and Waves
- ES250 Electrical Science
- EE264 Introduction to Digital Design

Elective Courses: 2 of 6

- EE221 Linear Circuits
- EE321 Systems and Signal Processing
- EE324 Dynamical Systems
- EE341 Microelectronic Circuits
- EE333 Power System Engineering
- EE360 Microprocessors

Minor in Engineering Science
The School of Engineering offers a minor in Engineering Science for students who satisfy a minimum of 20 credit hours as outlined below:

- Satisfy prerequisites (MA131, MA132, PH131, PH132, MA232, CM131 or equivalents) for the three core ES courses — ES220, ES250, ES260
- 1 Scientific Programming Course (minimum two Cr. Hrs. ES100 or equivalent)
- 3 Engineering Electives (minimum nine Cr. Hrs. — any ES, ME, AE, CE, CH, EE courses for which the candidate has the prerequisites, except ES238, ES300, EE268, BR200)

*not open to School of Engineering majors or Engineering & Management majors

Minor in Environmental Engineering
A minor in Environmental Engineering is available to all students except those majoring in Civil or Environmental Engineering. To obtain a minor, a student must successfully complete the following courses:

Required courses

1. **Choose one of:**
   - CE340 Introduction to Environmental Engineering (3 cr.)
   - CH220 Chemical Engineering Principles II: Material Balances (3 cr.)
   - CH250 Chemical Process Calculations (3 cr.) (class of 2011 and 2012 only)

2. **Choose one of:**
   - CH210 Chemical Engineering Principles I: Material Balances (3 cr.)
   - CM241 Organic Chemistry I (3 cr.)
   - CM371 Physical Chemistry I (3 cr.)
3. **Choose one of:**
   - BY222 Ecology (3 cr.) and BY224 Ecology Laboratory (2 cr.)
   - or
   - BY320 Microbiology (3 cr.)
   - or
   - BY240 Environmental Science and Policy of American Rivers (3 cr.)

4. **Choose one of:**
   - CE491 Senior (Water Resources/Environmental) Design (3 cr.)
   - MP401 Multidisciplinary Course (Environmental Remediation Design) (3 cr.)
   - MP444 EPA P3 Sustainable Design Competition (3 cr.)

   **Plus any two courses from the following:**

   - CE430 Water Resources Engineering II (3 cr.)
   - CE477 Atmospheric Chemistry (3 cr.)
   - CE435 Groundwater Hydrology and Geochemistry
   - CE478 Solid Waste Management and Landfill Design (3 cr.)
   - CE479 Water and Wastewater Treatment Processes (3 cr.)
   - CE480 Chemical Fate and Transport in the Environment
   - CE481 Hazardous Waste Management Engineering (3 cr.)
   - CE482 Environmental Systems Analysis Design (3 cr.)
   - CE486 Industrial Ecology (3 cr.)
   - CE580* Environmental Chemistry (3 cr.)
   - CE583* Modeling Natural Aquatic Systems (3 cr.)
   - CE584* Chemodynamics (3 cr.)
   - BY531* Limnology (4 cr.) Limnology (4 cr.) and BY531 Limnology Laboratory
   - CH434/ES434 Air Pollution Control (3 cr.)
   - ES432 Risk Analysis (3 cr.)
   - ES436 Global Climate Change: Science, Engineering & Policy (3 cr.)
   - ES464 Corrosion Engineering (3 cr.)
   - **either**
     - HS406 or Industrial Hygiene Control Methods (3 cr.)
     - HS416 Principles of Toxicology and Epidemiology (3 cr.)

*undergraduate students must have at least a 3.0 GPA and permission of their academic advisor to enroll in a 500 level course

**Total Credit hours for the Minor:** 18-20

*A minimum grade-point average of 2.0 is required in the courses taken for the minor. At least one quarter of the total credit hours required must be completed at Clarkson, unless the Dean of the Coulter School of Engineering approves an exception.*

**Minor in Sustainable Energy Systems Engineering**

Clarkson University offers a minor in Sustainable Energy Systems Engineering to all students who meet the prerequisite requirements. Our reliance on energy-rich sources of fossil fuels has enabled growth of modern society, increasing our mobility, industrial growth, domestic comfort, abundant food supply, and economic prosperity. Engineers are among the many types of professionals that need to understand the
limits of our present energy systems and lead us to a future in which we can continue to provide reasonable energy resources for human quality of life. This minor emphasizes that all engineering disciplines are necessary to develop and assess technologies to both increase the efficiency of our energy use and advance renewable and alternative energy sources.

A total of 21 credits is required for this minor. Depending upon the student’s major, between 9 – 12 hours of this 21 credit total are in addition to the major’s core requirements. A student must complete the course requirements as follows:

**Required Courses (3 credits each)**

Introduction to Energy Systems  
Thermodynamics  
Capstone Design (or energy related research)  
(With specific Energy Focus)

**Environmental Impacts Choice, one of:**

Industrial Ecology  
Global Climate Change: Science  
Engineering and Policy  
Sustainability and the Environment

**Policy Choice, one of:**

Environmental Law  
Biofuels and Farm Policy  
Environmental Policy  
Environmental Economics  
Energy Policy  
Sustainability Theory and Practice  
Environmental Ethics

Technology Choice, TWO of: (at least one must focus on energy technologies (including efficiency) as designated with the *)

* Energy technology related research project  
* Alternative Energy Systems  
** Energy Conversion  
Power Systems Engineering  
** Fundamentals of Building Systems  
Sustainable Infrastructure and Building  
** Sustainability Project Experience  
(applicability of this class changes annually based on specific class topic)
* Thermodynamic System Engineering  

ES238  
ES340 or CH260  
(one of: AE451, AE451, CE491, CE492, CH481  
EE412, ES456, ME446, ES443  
CE486  
ES436 *  
EV305  
POL375  
POL372  
POL470  
EC360  
POL471  
PHIL405  
PHIL370  
EE438  
EE331  
EE333  
CE409  
CE410  
EV390  
ME310
Minor in Software Engineering
A minor in Software Engineering is available to students in any degree program with the exception of the Software Engineering and Computer Science degree programs. See full description under Interdisciplinary Programs.

Minor in Sustainable Solutions for the Developing World
Solutions for the Developing World is available to students in any degree program. The minor seek to employ humanitarian principles toward sustainable solutions that address the conflict that often occurs between economic development and environmental justice predominant in the developing world. A goal of the curriculum is to provide students with the tools to understand issues concerning social justice and sustainability to be used when designing and implementing solutions for the developing world. To obtain the minor, a student must complete the following courses.

Required Courses:

1. Three credit total from the following list of courses 1 (3 cr. total):
   - ANTH 381  Consumption and Culture (3 cr.)
   - CE434  Sustainable Development Engineering
   - EV 305  Sustainability and the Environment (3 cr.)
   - EV 300  Environmental Leadership (3 cr.)
   - EV390  Sustainability Project Experience
   - PHIL 370  Environmental Ethics (3 cr.)
   - PHIL 405  Sustainability Theory and Practice: A Critical Assessment (3 cr.)
   - POL 350  International Development and Social Change (3 cr.)

2. Two of the following courses 2 (6 cr. total)
   - ANTH 201  Introduction to Anthropology (3 cr.)
   - ANTH 351  Global Forces, Local Outcomes (3 cr.)
   - COMM 428  Public Debate and the Environment: Reading & Writing Environmentally (3 cr.)
   - LIT 250  World Literature (3 cr.)
   - LIT 251  Understanding Vietnam (3 cr.)
   - LIT 353  African Literature (3 cr.)
   - PHIL 310  World Religious and Contemporary Issues (3 cr.)
   - POL 250  Politics in Cross National Perspective (3 cr.)
   - POL 251  Introduction to International Politics (3 cr.)
POL 362 Human Rights Law and Politics (3 cr.)
SOC 330 Health, Wealth, Inequality, and the Environment (3 cr.)

3. Two of the following courses 3 (6 cr. total)
   MK 436 Creativity, Innovation and New Product Development (3 cr.)
   SB 396 Global Business Strategies (3 cr.)
   MK 320 Principles of Marketing (3 cr.)
   OM 476 Management of Technology (3 cr.)
   OM 380 Project Management (3 cr.)
   EC 360 Environmental Economics (3 cr.)
   ES 438 Alternative Energy Systems (3 cr.)

4. ONE of the following courses (3 cr.)
   UNIV 399 Global Experience (with Sustainable Solutions for the Developing World emphasis), recommended for all students; OR A Multidisciplinary project course (with Sustainable Solutions for the Developing World emphasis) if approved by the director of the minor and the chair or advisor for the student’s major program of study.

The multidisciplinary project is intended to serve as the Capstone, Senior Design, or other culminating project based experience that is normally completed within the student’s major program of study. Students participating in the minor will engage in a multidisciplinary project developed by students with the minor faculty who support the minor OR the student may participate in related experiences and opportunities within the student’s major program of study that are thematically linked to this minor. For example, if a student’s senior design course within their major has a multidisciplinary them and relates to strategies employable in developing world, the student can obtain approval from the director of the minor for the course to serve as the minor required course.

Knowledge Areas

CGI Contemporary/Global Issues
EC Economics/Organizations
STS Science, Technology, and Society
CSO Cultures and Societies
IA Imaginative Arts
UNIV University Course
1C/2C Communication Points
Undergraduate Professional Concentrations in Engineering

Architectural Engineering
A professional concentration in Architectural Engineering is available to students who are planning a career in building design, including architectural, structural, construction, foundation and environmental aspects. The professional concentration allows students to satisfy the accreditation requirements in civil engineering while pursuing a concentration in architectural engineering.

Courses required for a concentration in architectural engineering are listed below. The total number of credits required for the concentration is 24, of which 18 credits have to be selected as professional electives.

CE448 Introduction to Architectural Engineering
E445 Timber Design or CE446 Reinforced Masonry Design
CE 415/515 Foundation Design
CE 441 Reinforced Concrete Design
CE 442 Steel Design
CE 492 Senior (Building, Architectural) Design

And at least two of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CE 405</td>
<td>Construction Management</td>
</tr>
<tr>
<td>CE 408</td>
<td>Building Information Modeling and Integrated Product Delivery</td>
</tr>
<tr>
<td>CE 411</td>
<td>Construction Materials</td>
</tr>
<tr>
<td>CE 420/520</td>
<td>Advanced Structural Analysis</td>
</tr>
<tr>
<td>CE 421/521</td>
<td>Composite Mechanics and Design</td>
</tr>
<tr>
<td>CE542</td>
<td>Advanced Steel Design</td>
</tr>
<tr>
<td>CE 544</td>
<td>Advanced Concrete Design</td>
</tr>
<tr>
<td>CE 453/553</td>
<td>Properties and Performance of Concrete Mat’ls</td>
</tr>
<tr>
<td>CE 455/555</td>
<td>Structural Damage, Rehabilitation, and Repair</td>
</tr>
<tr>
<td>CE 457/557</td>
<td>Environmental Degradation of Concrete Structures</td>
</tr>
<tr>
<td>ME310</td>
<td>Thermodynamic System Engineering</td>
</tr>
<tr>
<td>ME411</td>
<td>Introduction to Heat Transfer</td>
</tr>
<tr>
<td>ME 444</td>
<td>Computer Aided Engineering</td>
</tr>
<tr>
<td>CE 438 or CE 538</td>
<td>Finite Element Methods</td>
</tr>
<tr>
<td>CE 486/586</td>
<td>Intro to Industrial Ecology</td>
</tr>
<tr>
<td>EHS406</td>
<td>Industrial Hygiene Control Methods</td>
</tr>
</tbody>
</table>

Or other course as designated by CEE Department Chair

In addition to the required number of credits, it is recommended that students in the architectural engineering concentration take relevant liberal arts courses, as well as writing intensive communication (COMM) courses. Architecture related liberal arts courses such as History of World Architecture, Architecture and Culture, Idea and Image, Greek Art and Architecture, Roman Art and Architecture may also be taken by cross-registration at an Associated College. A minimum grade-point average of 2.0 is required in the courses taken for this professional concentration. At least nine of the credit hours required in the concentration must be completed at Clarkson University unless the dean of the Coulter School of Engineering approves an exception. By successfully completing the requirements above, upon graduation students will receive a Dean’s Certificate in Architectural Engineering.
**Biomolecular Engineering**

A professional concentration in Biomolecular Engineering has been designed for chemical engineering majors who desire a strong background in biochemical engineering and biology. This will benefit students pursuing careers in medicine, biomedical engineering or in the following industries: consumer products, food processing, and pharmaceuticals. The decision to obtain this concentration is made optimally in the sophomore year.

The professional concentration in Biomolecular Engineering offers a chemical engineering major an alternative path for obtaining a BS degree in Chemical Engineering. Students in the classes of 2011 and 2012 must take BY160 Cellular & Molecular Biology (3 Cr. Hrs.) and BY162 Cellular & Molecular Biology Lab (2 Cr. Hrs.) in spring semester of sophomore year. BY160 is a requirement for all chemical engineering students in the classes of 2013 and later; students pursuing the concentration must also take the BY162 laboratory course. For all students, the required mathematics elective must be a suitable statistics course (STAT383 Applied Statistics) and science and engineering electives are replaced with the required courses CM460 Biochemistry I and CH465 Biochemical Engineering. An undesignated elective is replaced with a course selected from the following list of courses relevant to biomolecular engineering: BR400 Introduction to Biomedical Rehabilitation Engineering and Science, BY214 Genetics, BY312 Advanced Cell Biology, BY316 Immunobiology, BY320/322 Microbiology with Lab, BY360/362 Physiology with Lab, BY412 Molecular Biology Laboratory, CM426 Intro to Biophysics, CM453 Intro to Biomaterials, CM464 Physical Biochemistry, ES380 Biomechanics or ES452 Biomaterials and Biomedical Engineering Applications. Further information on this concentration is available in the Department of Chemical Engineering office.

By successfully completing the courses recommended above, upon graduation, students receive a bachelor’s degree in Chemical Engineering with a Dean’s Certificate indicating a “Professional Concentration in Biomolecular Engineering” and a notation to that effect on their transcript.

**Construction Engineering Management**

A professional concentration in Construction Engineering Management is available to permit civil engineering majors to focus their electives on courses pertinent to the field of construction engineering and management. Electives used to satisfy the requirements of the concentration include a set of courses that reflect the subdiscipline of Construction Engineering as defined by the Accreditation Board of Engineering and Technology (ABET).

To obtain a Professional Concentration in Construction Engineering Management, a student must choose required and professional electives in order to complete the following seven courses:

- CE411 Construction Materials
- CE415/515 Foundation Design
- CE441 Concrete Design
- CE442 Steel Design
- at least two of the following CE courses:
  - CE405 Construction Planning
  - CE406 Construction Engineering
  - CE407 Construction Estimating and Scheduling
  - CE408 BIM/IPD
  - CE409 Fund. Of Building Systems
  - CE410/510 Sustainable Infrastructure and Building
  - CE445 Timber Design
  - CE446 Masonry Design
at least two of the following non-CE courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>OS446 Negotiations &amp; Relationship Management</td>
<td>EHS330 Safety Analysis</td>
</tr>
<tr>
<td>FN361 Financial Management</td>
<td>LW270 Law &amp; Society 1</td>
</tr>
<tr>
<td>EM/OM 451 Quality Management &amp; Lean Enterprise</td>
<td>LW446 Law of the Work Place</td>
</tr>
<tr>
<td>EM/OM380 Project Management</td>
<td>COMM417 Business &amp; Professional Speaking</td>
</tr>
</tbody>
</table>

In addition to the required courses, it is recommended that MA383 Applied Statistics I be taken as a mathematics elective course for this concentration.

By successfully completing the courses recommended above, upon graduation, students receive a bachelor’s degree in their major with a Dean’s Certificate indicating a “Professional Concentration in Construction Engineering Management” and a notation to that effect on their transcript.

**Electric Power Engineering**
Clarkson University offers a professional concentration in Electric Power Engineering that is available to electrical engineering majors. The concentration consists of:

1. EE 331 Energy Conversion
2. EE 333 Power System Engineering
3. EE 431 Power Transmission and Distribution
4. 2 Power elective courses
5. 1 Breadth elective course

Typical power electives:

- EE 430 High Voltage Techniques and Measurements
- EE 439 Dielectrics
- EE 438 Alternate Energy Systems
- ES 340 Thermodynamics
- Any power engineering graduate course w/dept. approval

Typical Breadth electives:

- EE 450 Control Systems
- EE 451 Digital Control
- EE 401 Digital Signal Processing
- EE 446 Instrumentation
- EE 407 Computer Networks
- EE 365 Advanced Digital Circuit Design

Electives not on these lists must be approved by the ECE Department.

By successfully completing the concentration, upon graduation, students receive a BS in Electrical Engineering with a Dean’s Certificate indicating a “Professional Concentration in Electric Power Engineering” and a notation to that effect on their transcript.
Environmental Engineering
A professional concentration in Environmental Engineering is available to all civil engineering students. Electives used to satisfy requirements of the concentration include a set of science and engineering courses that reflect the sub-disciplines of Environmental Engineering as defined by the Accreditation Board of Engineering and Technology (ABET). Students receive a Bachelor of Science degree in civil engineering with a professional concentration in Environmental Engineering.

Choose one of:
CE340 Introduction to Environmental Engineering
CH220 Chemical Engineering Principles II: Material Balances

Choose one of:
CH210 Chemical Engineering Principles I: Material Balances
CM241 Organic Chemistry I
CM371 Physical Chemistry I

Choose one of:
BY222 Ecology and BY224 Ecology Laboratory
BY240 Environmental Science and Policy of American Rivers
BY320 Microbiology

Choose one of:
CE491 Senior (Water Resources/Environmental) Design
MP401 Multidisciplinary Course (Environmental Remediation Design)

Plus any two courses from the following:

| CE430 Water Resources Engineering II | CE486 Industrial Ecology |
| CE435 Groundwater Hydrology and Geochemistry | CE580 Environmental Chemistry |
| CE477 Atmospheric Chemistry | CE584 Chemodynamics |
| CE478 Solid Waste Management and Landfill Design | BY531 Limnology and BY532 Limnology Laboratory |
| CE479 Water and Wastewater Treatment Processes | CH434/ES434 Air Pollution Control |
| CE480 Chemical Fate and Transport in the Environment | ES432 Risk Analysis |
| CE481 Hazardous Waste Management Engineering | ES436 Global Climate Change: Science, Engineering & Policy |
| CE482 Environmental Systems Analysis Design | ES464 Corrosion Engineering |
| EHS406 Industrial Hygiene Control Methods or EHS416 Principles of Toxicology and Epidemiology | |
CE majors that are in the Environmental concentration are recommended to take ES 250 Electrical Science rather than ES 223 Rigid Body Dynamics for their Sophomore ES elective. In addition to the required courses, it is recommended that MA 383 Applied Statistics be taken as a mathematics elective course for this professional concentration. A minimum grade point average of 2.0 is required in the courses taken for their professional concentration. At least one-fourth of the credit hours required must be completed at Clarkson University, unless the Dean of the Coulter School of Engineering approves and exception.

Materials Engineering
Many engineers and scientists are employed in the materials processing and manufacturing industries. Increasing demands on the mechanical and environmental durability of national infrastructure require improving the strength and useful life of steels, concrete, ceramics and other engineering/structural materials. Space exploration and miniaturization of electronic devices, for example, are made possible by the development and processing of nanostructured composite materials through nanotechnology.

To help students improve employment opportunities in materials-related areas, Clarkson University is offering a concentration in Materials Engineering.

A Clarkson student can qualify for a Certificate from the dean of the Coulter School of Engineering verifying satisfactory completion of the coursework necessary to create a Professional Concentration in Materials Engineering. To attain this, the student must complete five (5) courses, which include two (2) required courses and three (3) electives from the list given. The required courses are:

ES260 Materials Science and Engineering I
ES360 Materials Science and Engineering II

The three elective courses must be chosen from the following list of materials engineering and science courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE411</td>
<td>Construction Materials Eng.</td>
<td>ME390</td>
<td>Manufacturing Processes</td>
</tr>
<tr>
<td>CM430</td>
<td>Colloids and Interfaces</td>
<td>ME393</td>
<td>Analysis of Materials Processing</td>
</tr>
<tr>
<td>CM450</td>
<td>Introduction to Polymer Chemistry</td>
<td>ME457</td>
<td>Composite Mechanics</td>
</tr>
<tr>
<td>EE439</td>
<td>Dielectrics</td>
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<tr>
<td>ES357</td>
<td>Microelectronic Circuit Fabrication</td>
<td>ME591</td>
<td>Selected Topics in Materials Engineering:</td>
</tr>
<tr>
<td>ES452</td>
<td>Biomaterials and Biomedical Engineering Applications</td>
<td></td>
<td>(Spring)</td>
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<tr>
<td>ES464</td>
<td>Corrosion Engineering</td>
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<tr>
<td>CM430</td>
<td>Colloids and Interfaces</td>
<td></td>
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</tr>
<tr>
<td>PH341</td>
<td>Solid State Physics I</td>
<td></td>
<td></td>
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<tr>
<td>PH442</td>
<td>Solid State Physics II</td>
<td></td>
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<tr>
<td>ES361</td>
<td>Fine Particle Technology</td>
<td></td>
<td></td>
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<tr>
<td>ME492</td>
<td>Welding Metallurgy</td>
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</table>

Application forms may be obtained on line or from any engineering department office.
Structural Engineering

A professional concentration in Structural Engineering is available to civil engineering students to increase their ability to modernize and increase the effectiveness of the nation’s physical infrastructure. This challenge involves the design and construction of new physical systems such as our highways, harbors and waterways, bridges, buildings, and water treatment facilities. This effort requires a variety of specialized talents that can in part be developed through the selection of professional electives.

To obtain a Professional Concentration in Structural Engineering, a student must choose required and professional electives in order to complete the following seven courses:

- CE 420/520 Advanced Structural Analysis
- CE 415/515 Foundations Design
- CE 441 Reinforced Concrete Design
- CE 442 Steel Design
- CE 490 or CE 492 Senior Design

Choose at least TWO of the following:

<table>
<thead>
<tr>
<th>Course Selection</th>
<th>Course Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 401/501 Fracture Mechanics of Concrete Structures</td>
<td>CE 455/555 Structural Damage, Rehabilitation, and Repair</td>
</tr>
<tr>
<td>CE 411 Construction Materials</td>
<td>CE 438 or CE 538 Finite Element Methods</td>
</tr>
<tr>
<td>CE 421/521 Composite Mechanics and Design</td>
<td>CE 444/544 Advanced Concrete Design</td>
</tr>
<tr>
<td>CE 453/553 Properties and Performance of Concrete Materials</td>
<td>CE 457/557 Environmental Degradation of Concrete Structures</td>
</tr>
<tr>
<td>ME 444 Computer Aided Engineering</td>
<td>CE 512 Fundamentals of Dynamics and Vibrations</td>
</tr>
</tbody>
</table>

It is of particular importance for transfer students to be aware of the sequence of prerequisite courses required to complete Steel and Concrete Design for the Structural Engineering concentration. This sequence consists of ES220, ES222, CE320, CE441 (Fall), CE442 (Spring) and requires five semesters if transfer students have not taken ES220 Statics before entering Clarkson. In special circumstances ES222 and CE320 can be taken concurrently.

By successfully completing the courses recommended above, upon graduation, students receive a bachelor’s degree in their major with a Dean’s Certificate indicating a “Professional Concentration in Structural Engineering” and a notation to that effect on their transcript.
INSTITUTE FOR A SUSTAINABLE ENVIRONMENT

Susan Powers, Interim Director and the Spence Professor in Sustainable Environmental Systems;
Alan Rossner, Associate Director

The Clarkson Institute for a Sustainable Environment (ISE) is home to Clarkson's environmental activities associated with research, interdisciplinary graduate and undergraduate degree programs, and outreach programs. The Institute was established to support Clarkson’s long-standing expertise in this field and to increase collaboration among faculty.

The Institute for a Sustainable Environment is a collaborative and multidisciplinary community that serves as the hub for the University’s drive toward a sustainable world. We facilitate high impact learning experiences, foster transformative scholarship, and engage the campus and broader community in order to understand and address environmental and sustainability challenges.

Recognizing that environmental problems increasingly require the expertise of many disciplines and points of view, the Institute promotes partnerships and interdisciplinary activities that enable the integration of basic and applied research, providing the increased understanding about environmental systems that is needed for informed decisions and policies. Fostering links among its members to facilitate environmental activities, ISE sponsors workshops, seminars, and small grants programs.

For further information about ISE, e-mail isegrad@clarkson.edu or call 315-268-3856.

BS in Environmental Science & Policy

Alan Rossner, Director

Concerns about environmental issues are increasingly at the forefront of governmental policy, corporate planning, and the day-to-day choices of families like yours. Government-supported research focuses on important topics such as global warming, depletion of the ozone layer, and acid rain. Corporations seek new production methods and materials to decrease industrial pollution. At home we recycle our garbage and purchase products with less packaging.

Cleaning up the pollution of the past and confronting contemporary environmental challenges requires creative and multidisciplinary solutions. Those most successful in addressing these complex issues will be trained in a variety of backgrounds. They will understand the basic concepts in the life sciences and their application to real-world problems. They will appreciate the history and complexity of social and political systems. And they will be knowledgeable in environmental regulation and policy. Clarkson’s Environmental Science and Policy (ES&P) program prepares its graduates to become effective leaders by providing a broad-based, interdisciplinary background.

Clarkson undergraduates experience hands-on learning that includes assisting the faculty with research projects and working on independent projects. The coursework is challenging but flexible, and the ES&P degree allows students significant freedom in choosing their emphasis in an environmental area. The curriculum is also well suited as a preparatory degree for students interested in pursuing a degree in the health sciences, including medicine, dentistry, and veterinary science.
Programs can be tailored to meet the interests of the student. To this end, Clarkson offers both a minor and a major in Environmental Science & Policy. Upon successful completion of the major, a student will be awarded a Bachelor of Science (BS) degree. The major allows students to pursue their study of the environment in an interdisciplinary fashion.

There are required courses in biology, ecology, business, chemistry, liberal arts, and mathematics. Using these as a foundation, students can use professional electives to investigate environmentally related issues of interest in more depth.

Students in completing the Clarkson's ES&P program are expected to meeting the following goals:

- Develop a foundation in natural sciences
- Understand how technology has impacted the environment, and how technology can also be a solution to environmental challenges
- Understand how science and public values guide policy
- Understand how policy influences scientific endeavors
- Understand how policy impacts the environment and public health
- Develop quantitative and qualitative analysis skills
- Develop skills for communicating complex scientific information to nonscientists
- Complete an independent ES&P research experience
- Practice ES&P through a professional experience

### Environmental Science & Policy Curriculum

#### FIRST YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<th>Course</th>
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<th>Cr. Hrs.</th>
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<td>BY160</td>
<td>Cellular &amp; Molecular Biology</td>
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**Total Cr. Hrs:** 16  
**Total Cr. Hrs:** 15
## SECOND YEAR

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<tr>
<td>EV305</td>
<td>Sustainability &amp; The Environment</td>
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<td>POL</td>
<td>Environmental Policy^1</td>
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<td>EV313</td>
<td>Biogeochemical Systems Science</td>
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<td>PHIL 405 KA/UC Sustainability: Theory &amp; Practice</td>
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**Total: 16**

### Second Semester

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**Total: 17**

## THIRD YEAR

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<td>Policy Elective</td>
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<td>POL 471</td>
<td>Energy Policy^1</td>
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<td>Knowledge Area Course^1</td>
<td>Prof./Sci/Math/Eng Elective</td>
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<td>EHS Elective</td>
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<td>Free Elective</td>
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<td>Professional Elective</td>
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**OR**

| ADK Semester (Recommended) | 15 |  |

## FOURTH YEAR

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<td>ES432</td>
<td>Risk Analysis (Tech)</td>
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<tr>
<td>Prof. Sci./Eng/Math Elective</td>
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<td>EV401</td>
<td>Capstone Project</td>
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<td>POL 375</td>
<td>Environmental Law</td>
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**OR**

| ADK Semester (Recommended) | 15 |  |
1. Various environmental courses will meet knowledge area requirements. A technology course will be required if one of the major courses does not fulfill this requirement.
2. Or suitable Biology/Chemistry/Engineering course
3. EC150 or EC350 is required as a prerequisite for Environmental Economics (EC360) and will satisfy a knowledge area requirement
4. Or suitable technology course

NOTE: Some electives may require additional prerequisites. Students must be registered for at least 14 credits to qualify for Dean’s List or as a Presidential Scholar.

PROFESSIONAL ELECTIVES
Professional Electives are defined as electives appropriate to the professional and career objectives of students and the ES&P Program. Professional electives are typically upper-level courses (300-level or above) chosen with the advice and consent of the student’s advisor, and focused on a minor, concentration or double major (in Biology, Chemistry, Environmental Engineering, Environmental Health Science, Law, or Communication, for example). The following courses are considered professional electives.

| SCIENCE |
|---------------------------------|-----------------|
| BY300 Recent Advances in Biological Research | BY214 Genetics |
| BY302 Plant Science of Northern New York | BY310 Developmental Biology |
| BY312 Adirondack Ecology and Environmental Science | BY314 Bioinformatics |
| BY320 Microbiology | BY320 Microbiology |
| BY326 Invertebrate Biology | BY323 Microbiology for Eng. |
| BY340 Behavioral Ecology and Sociobiology | BY328 Conservation Biology |
| BY358 Animal Learning and Cognition | BY420 Evolution |
| BY412 Molecular Biology | BY431 Limnology |
| BY451 Biochemistry II | STAT318 Bio statistics |
| CM242 Organic Chemistry II | BY450 Biochemistry I |
| CM244 Organic Chemistry Lab | CM221 Spectroscopy |
| CM304 Environmental Science II | CM223 Spectroscopy Lab |
| EHS320 Principles of Ergonomics | CM460 Biochemistry |
| EHS406 IH Control Methods | EHS405 Methods for Analysis |
| MA231 Calculus III | EHS416 Principles of Toxicology & Epidemiology |
| PH142 Physics for Life Sciences II | MA232 Elementary Diff. Equations |
| | PH132 Physics II |
| | PH426 Introductions to BioPhysics |
### ENGINEERING

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<tr>
<td>CE301</td>
<td>Geographical Information Systems</td>
<td>CE340</td>
<td>Intro to Environ. Engineering</td>
</tr>
<tr>
<td>CE470</td>
<td>Stream Riparian System and Fluvial Morphology</td>
<td>CE478</td>
<td>Solid Waste Mgmt. and Landfill Design</td>
</tr>
<tr>
<td>CE480</td>
<td>Environmental Quality Engineering</td>
<td>CE477</td>
<td>Atmospheric Chemistry</td>
</tr>
<tr>
<td>CE490</td>
<td>Senior Design</td>
<td>CE479</td>
<td>Water and Wastewater Treatment Proc.</td>
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<tr>
<td>ES330</td>
<td>Fluid Mechanics</td>
<td>CE481</td>
<td>Hazardous Waste Management</td>
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<tr>
<td>ES532</td>
<td>Risk Analysis</td>
<td>CE586</td>
<td>Industrial Ecology</td>
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<td></td>
<td></td>
<td>EV/CE 435</td>
<td>Groundwater Hydrology and Geochemistry</td>
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<tr>
<td>LW471</td>
<td>Law and Society II</td>
<td>LW466</td>
<td>The Law of the Workplace</td>
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<tr>
<td>EC388</td>
<td>Game Theory and Economic Strategy</td>
<td>OS286</td>
<td>Organizational Behavior</td>
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### BUSINESS

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### LIBERAL ARTS

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<td>ANTH370/EV225</td>
<td>Env., Tech., &amp; Society</td>
<td>SOC/POL470</td>
<td>Environmental Policy</td>
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<tr>
<td>POL220</td>
<td>American Politics</td>
<td>SOC/ANTH 397</td>
<td>Cities and Social Justice</td>
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<td>SOC/POL 351</td>
<td>Globalization</td>
<td>POL250</td>
<td>Politics in C-N Perspective</td>
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<tr>
<td>HIST230</td>
<td>Science and Society</td>
<td>PHIL341</td>
<td>Professional Ethics</td>
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<tr>
<td>POL400</td>
<td>Constitutional Law</td>
<td>PHL243</td>
<td>American Environmentalism</td>
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<tr>
<td>COMM310</td>
<td>Mass Media and Society</td>
<td>COMM313</td>
<td>Professional Communication</td>
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<td>COMM412</td>
<td>Organizational Communications and Public Relations Theory</td>
<td>COMM341</td>
<td>Introduction to Web Design</td>
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<td>POL380</td>
<td>Law &amp; Bioethics</td>
<td>COMM/EV4 28</td>
<td>Environmental Communication</td>
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<tr>
<td>POL302</td>
<td>Contemporary Political Theory</td>
<td>POL374</td>
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Professional electives in the ES&P Program. Additional courses may be taken pending permission from the student’s advisor. Some professional electives require additional prerequisites.
BS in Environmental Health Science
Alan Rossner, Director

Environmental Health Sciences (EHS) is a multidisciplinary program at Clarkson University focused on the study of how the natural and built environment impacts human health. In this continually evolving field, students study human exposure to chemicals, indoor air quality, water quality, air quality assessments in communities downwind of factories or busy highways, hazardous waste site assessment, and environmental sustainability. EHS practitioners anticipate, measure, and control hazardous biological, chemical, and physical agents. EHS specialist work closely with engineers, occupational health physicians, nurses, safety specialists, and physical therapists to identify the chemical and physical agents responsible for disease in our living environments, as well as hazard control and management strategies.

The EHS curriculum is rigorous and effectively prepares students to work in the important area of environmental health and safety. In addition, the EHS curriculum is well suited as a preparatory degree for students interested in pursuing a professional degree in health sciences, including physical therapy, medicine, dentistry, and veterinary school. The program in Environmental Health Science stresses a strong background in the basic sciences, specific course work in Environmental Health and safety, and industrial hygiene experience gained through laboratory exercises in environmental monitoring, field trips, co-op and internships.

The Goal of Clarkson University's Environmental Health Science Program is to promote the prevention of illness and injury due to environmental and occupational hazards through education, training, and applied research.

Objectives:
• Recognize and evaluate types of occupational and environmental health hazards present in modern workplace and community environments.
• Study methods used to detect and quantify hazards, and the implement technologies used to control health hazards.
• Understand biological responses from exposures to hazardous agents
• Describe and evaluate regulations and policies associated with environmental health
• Develop the skills to manage and control hazards and risks
• Complete an independent EHS research experience
• Prepare students for a career in Environmental Health Science with a coordinated multidisciplinary education using a curriculum based on a strong foundation in mathematics, physical sciences, biology, engineering and health sciences such as toxicology and epidemiology.

Requirements:
a. 120 credit hours total.
b. Two Math courses and one statistics course.
c. Minimum of 11-17 credit hours in Chemistry depending up the chosen concentration
d. Minimum of 13 credit hours in Biology.
e. Additional Minimum of 12 credit hours in Science and/or Engineering.
f. Eight credit hours in Physics.
g. Minimum of 18 credit hours of EHS courses.
h. Three credit Capstone research project.
i. Meet the university requirements for knowledge areas, communication points, technology serving humanity course, and the professional experience.

### Environmental Health Science Sample Curriculum

<table>
<thead>
<tr>
<th>First Year</th>
<th>First Semester</th>
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<td>BY142</td>
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<td>CM131</td>
<td>Gen. Chemistry I w/Lab or</td>
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Knowledge Area Course 3  Professional Elective 3

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Knowledge Area Course 3  Professional Elective 3

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<td>Advanced Topics in EHS</td>
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</thead>
<tbody>
<tr>
<td>EV400</td>
<td>Capstone Project</td>
<td></td>
<td>EHS481</td>
<td>Advanced Topics in EHS</td>
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<tr>
<td>EHS416</td>
<td>Principles of Toxic &amp; Epidemiology</td>
<td>3</td>
<td>Knowledge area Course #5</td>
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<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs</th>
<th>Course</th>
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<tbody>
<tr>
<td>EV400</td>
<td>Capstone Project</td>
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<td>EHS481</td>
<td>Advanced Topics in EHS</td>
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<td>EHS416</td>
<td>Principles of Toxic &amp; Epidemiology</td>
<td>3</td>
<td>Knowledge area Course #5</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

1. Or suitable Biology/Chemistry/Engineering course
2. Or other suitable Engineering elective.
3. Or other suitable Statistics course

**Concentrations**

**EHS Concentration in Environment and Security**

A concentration in *Environment and Security* requires 20 or more credits in the following specified areas. Completion of an approved concentration will be designated on the student’s transcript.

**Students must take the following:**
CM 221 Spectroscopy (3 Credits)
CM 223 Spectroscopy Laboratory (3 Credits)
BY 320 Microbiology I & Lab (3 Credits)
BY 322 Microbiology Lab (2 Credits)
EV400/401 Capstone Project related to Environment and Security (4 Credits)

In addition students must select 2 of the following from SUNY Canton:
JUST 230 Fundamentals of Homeland Security (3 Credits)
JUST 326  Threats to Homeland Security (3 Credits)
JUST 420  The Corporate Role in Homeland Security (3 Credits)
EHS 401  Chem, Bio, & Rad Forensics and Terrorism Threats (3 credits)

- Other suitable course Criminal Justice/Homeland security courses can be approved by the Director of the ISE or designee.

**EHS Concentration in Ergonomics**
A concentration in *Ergonomics* requires 16 or more credits in the following specified areas. Completion of an approved concentration will be designated on the student’s transcript.

**Students must take the following:**
BR 200 Introduction to Biomedical Rehabilitation (3 Credits)
EHS 330 Safety Mgmt/ EHS 320 Ergo course (3 Credits)
EV400/EV 401 Capstone Project – Ergonomics – related (4 Credits)

**In addition students must select at least 2 of the following courses:**
BY 460  Kinesiology II (3 Credits)
BY 471  Anatomy & Physiology I (3 Credits)
BY 472  Anatomy & Physiology II (3 Credits)*
ME 380  Special topics Biomechanics (3 Credits)*
BY 360  Physiology (3 Credits)
BY 350  Comparative Anatomy (3 Credits)

- Other suitable course Ergonomics related courses can be approved by the Director of ISE or designee.
- * NOTE: BY 472 requires BY 471 as a pre-requisite.
- * ME 380 requires: MA 132 and PH 131 as pre-requisites.

**EHS Concentration in Industrial Hygiene**
A concentration in *Industrial Hygiene* requires 19 or more credits in the following areas. Completion of an approved concentration will be designated on the student’s transcript.

**Students must take the following:**
CM 221  Spectroscopy (3 Credits)
CM 223  Spectroscopy Laboratory (3 Credits)
EHS 330  Safety Management (3 Credits)
EV 400/401  Capstone Project (4 Credits)

**In addition students must select 2 of the following courses:**
CE 301  Geographical Information Systems
CE 340  Intro to Environmental Engineering (3 Credits)
CE 435  Groundwater and Hydrology and Geochemistry (3 Credits)
CE 477  Atmospheric Chemistry (3 Credits)
CE 479  Water and Wastewater Treatment Process (3 Credits)
CE 481  Hazardous Waste Management Engineering (3 Credits)
CE 486  Industrial Ecology (3 Credits)
CM 242  Organic Chemistry (3 Credits) OR
CM 244  Organic Chemistry Lab (3 Credits)
CM 371  Physical Chemistry I (3 Credits)
CM 320  Separations and Radiochemistry (3 Credits)
CM 300  Instrumental Laboratory (3 Credits)

Other suitable course Industrial hygiene or chemistry related courses can be approved by the Director of the EHS program

**Minor in Environmental Health Science**

A minor in Environmental Health Science is available to all students except those majoring in this program. To obtain a minor, a student must successfully complete the following courses:

A. Required Courses

   EHS309 Introduction to Industrial Hygiene  
   EHS310 Introduction to Industrial Hygiene Lab  
   EV313 Biogeochemical Systems Science

B. Any two or three of these courses:

   EHS405 Methods & Analysis  
   EHS406 Industrial Hygiene Control Methods  
   EHS416 Principles of Toxicology & Epidemiology  
   EHS330 Safety Analysis  
   EHS481 Advanced Topics in Environmental Health  
   ES432 Risk Analysis – TECH serving humanity & Comm. Pt

C. Any one or two additional courses:

   CE340 Introduction to Environmental Engineering  
   CE480 Chemical Fate and Transport in the Environment  
   CE481 Hazardous Waste Management Engineering  
   CE479 Water and Wastewater Treatment Processes  
   CE477 Atmospheric Chemistry  
   CE580 Environmental Chemistry  
   CM371 Physical Chemistry I  
   BY320 Microbiology  
   BY350 Comparative Vertebrate Anatomy  
   BY360 Comparative Physiology  
   BY425 Biological Systems and Environmental Change  
   BY471 Human anatomy and Physiology I/II
In addition to the required courses, it is recommended that STAT 282 or STAT 383 or BY 318 be taken as a mathematics elective course for this minor. A minimum grade point average of 2.0 is required in the courses taken for the minor.

**Minor in Environmental Science**

1. Fifteen credits of environmental science, nine credits of which must be in the 300 level or higher courses. Courses are selected from Category I.
2. Six credits of environmental policy. Courses are selected from category II.
3. Three credits spread across the following areas:
   A. An independent research project (1 credit)
   B. An ES&P Multidisciplinary Project Course (1 credit)
   C. One of the following 1 credit courses in Category III below.

*EV313 Biogeochemical Earth Systems Science* is required for the science minor.

**Category I:**

**Course Offerings in Environmental Science**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BY140</td>
<td>General Bio I</td>
</tr>
<tr>
<td>BY222</td>
<td>General Ecology</td>
</tr>
<tr>
<td>BY224</td>
<td>General Ecology Lab</td>
</tr>
<tr>
<td>BY314</td>
<td>Bioinformatics</td>
</tr>
<tr>
<td>BY320</td>
<td>Microbiology</td>
</tr>
<tr>
<td>BY322</td>
<td>Microbiology Lab</td>
</tr>
<tr>
<td>BY328</td>
<td>Conservation Biology</td>
</tr>
<tr>
<td>BY340</td>
<td>Behavioral Eco. and Sociobiology</td>
</tr>
<tr>
<td>BY420</td>
<td>Evolution</td>
</tr>
<tr>
<td>BY425</td>
<td>Bio. Systems and Env'tl Change</td>
</tr>
<tr>
<td>BY/EV330</td>
<td>Great Lakes Water Pollution</td>
</tr>
<tr>
<td>BY431</td>
<td>Limnology</td>
</tr>
<tr>
<td>BY/EV312</td>
<td>Adirondack Ecology &amp; Env Science</td>
</tr>
<tr>
<td>EV316</td>
<td>Adirondack Env. Science</td>
</tr>
<tr>
<td>CE301</td>
<td>Eng. Measurements</td>
</tr>
<tr>
<td>CE340</td>
<td>Intro to Env. Engineering</td>
</tr>
<tr>
<td>ECE470</td>
<td>Hydraulic Eng.</td>
</tr>
<tr>
<td>CE474</td>
<td>Engineering Hydrology</td>
</tr>
<tr>
<td>CE479</td>
<td>Water &amp; Wastewater Trtmnt Proc.</td>
</tr>
<tr>
<td>CE301</td>
<td>ADK Geographical Info Systems</td>
</tr>
<tr>
<td>CE480</td>
<td>Env. Quality</td>
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<td>CE481</td>
<td>Hazardous Waste Mgmt</td>
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<td>CE482</td>
<td>Env. Systems</td>
</tr>
<tr>
<td>CE491</td>
<td>Senior Design Proj.</td>
</tr>
<tr>
<td>CE486</td>
<td>Industrial Eco.</td>
</tr>
</tbody>
</table>

*No more than six (6) credits of the engineering classes can be applied towards an Environmental Science Minor.*
**Category II:**

Courses in Environmental Policy

- ANTH270 Env’t, Tech, and Soc.
- PHIL405 Sustainability: Thry. and Pract.
- COMM428 Public Debate and Env’t
- COMM429 Issue Analysis and Advocacy
- EC360 Environmental Economics
- ES436 Global Climate Change: Sci, Eng, & Policy
- LW270 Law and Society I
- LW466 Law of the Workplace
- EM351 Quality Mgmt and Lean Enterprise
- EM361 Supply Chain Env. Mgmt
- EV314 Adirondack Integrated Research Project
- EV/SS320 Social & Pol Issues in the Adirondacks
- EC/EV315 Entrepreneurship & Economic Dev. in the Adirondacks

PHIL270 American Env
PHIL410 Where the Wild Things Are
PHI371 Energy and Society
POL220 American Politics
POL250 Politics in X-Nat'l Perspective
POL351 Globalization

**Category III:**

A. An independent research project (1 credit equivalent))
B. An ES&P Multidisciplinary Project Course (1 credit equivalent)
C. One of the following 1 credit courses (EV 100, 300, or 305)

*Additional courses may be taken to fulfill the minor requirements with permission from the director.*

**Minor in Environmental Policy**

1. Fifteen credits of environmental policy, nine of which must be in the 300 hundred level or higher courses. Courses are selected from Category I.
2. Six credits of environmental science. Courses are selected from Category II.
3. Three credits spread across the following areas:
   A. An independent research project (1 credit)
   B. An ES&P Multidisciplinary Project Course (1 credit)
   C. One of the following 1 credit courses from Category III.

**Category I:**

Courses in Environmental Policy

- ANTH270 Env’t, Tech, and Society
- PHIL405 Sustainability: Thry and Practice
- PHIL270 American Environmentalism
- PHIL410 Where the Wild Things Are
Category II:

Course Offerings in Environmental Science

BY140 General Biology I
BY222 General Ecology
BY224 General Ecology Lab
BY314 Bioinformatics
BY320 Microbiology
BY322 Microbiology Lab
BY328 Conservation Biology
BY340 Behavioral Ecology and Sociobiology
BY420 Evolution
BY425 Bio Systems and Env Change
BY/EV330 Great Lakes Water Pollution
BY431 Limnology
BY 160 General Biology II
CM221 Spectroscopy
CE301 Eng. Measurements
CE340 Intro. to Env. Engineering
ECE470 Hydraulic Engineering
CE474 Engineering Hydrology
CE479 Water & Wastewater Treatment Processing
BY/CE 435 Groundwater
CM371 Physical Chemistry
CM476 Atmospheric Chemistry
CH434 Air Pollution Controls
EHS309 Industrial Hygiene
EHS310 Intro to Industrial Hygiene Lab
EHS405 Methods and Analysis
EHS416 Princ. of Toxicology and Epidemiology
EV/CE 435 Groundwater
EV314 Adirondack Integrated Research Project
ES432 Risk Analysis
BY/EV312 Adirondack Ecology & Env Science
EV314 Adirondack Integrated Res. Project
BY/EV312 Adirondack Ecology & Env Science
EV316 Adirondack Environmental Science
CE301 ADK Geo. Information Systems
CE480 Env. Quality
CE481 Hazardous Waste Mgmt.
CE482 Environmental Systems
CE491 Senior Design Project
CE486 Industrial Ecology
*No more than six (6) credits of the engineering classes can be applied towards an Environmental Science Minor.

Category III:
Three courses spread across the following areas: (These can be projects from classes or specific course.)
A. An independent research project (1 credit equivalent))
B. An ES&P Multidisciplinary Project Course (1 credit equivalent)
C. One of the following 1 credit courses (EV 100, 300, or 305)
D. Adirondack Semester Courses

*Additional courses may be taken to fulfill the minor requirements with permission from the director.

Minor in Sustainable Solutions for the Developing World

A minor in Sustainable Solutions for the Developing World is available to students in any degree program. The minor seeks to employ humanitarian principles toward sustainable solutions that address the conflict that often occurs between economic development and environmental justice predominant in the developing world. A goal of the curriculum is to provide students with the tools to understand issues concerning social justice and sustainability to be used when designing and implementing solutions for the developing world.

To obtain the minor, a student must complete the following courses.

1. Three credit total from the following list of courses 1 (3cr. total):
   ANTH 381 Consumption and Culture (3 cr.)  CGI/EC/UNIV
   CE434 Sustainable Development Engineering  STS, 1C, 2 design
   EV 305 Sustainability and the Environment (2cr.)  1C
   EV 300 Environmental Leadership (2 cr.)  1C
   EV390 Sustainability Project Experience  STS, 2C
   PHIL 370 Environmental Ethics (3 cr.)  STS; 1C
   PHIL 371 Energy and Society (3cr.)  CGI/STS/UNIV; 1C
   PHIL 405 Sustainability Theory and Practice: A Critical Assessment (3cr.)  STS; 1C

2. Two of the following courses 2 (6 cr. total)
   ANTH 201 Introduction to Anthropology (3cr.)  CGI/CSO/UNIV
   ANTH 351 Global Forces, Local Outcomes (3 cr.)  CGI/CSO/UNIV
   COMM 428 Public Debate and the Environment (3 cr.)  CGI/STS/UNIV
   LIT 250 World Literature (3 cr.)  CSO/IA/UNIV; 1C
   LIT 251 Understanding Vietnam (3 cr.)  CSO/IA/UNIV
LIT 353 African Literature (3 cr.) CSO/IA/UNIV; 1C
PHIL 310 World Religious and Contemporary Issues (3 cr.) CGI/IG/UNIV; 1C
POL 250 Politics in Cross-National Perspective (3 cr.) CGI
POL 251 Introduction to International Politics (3 cr.) CGI/IG/UNIV
POL 362 Human Rights Law and Politics (3 cr.) CGI; 1C
SOC 330 Health, Wealth, Inequality, and the Environment (3 cr.) STS; 1C

3. Two of the following courses (6 cr. total)
MK 436 Creativity, Innovation and New Product Development (3 cr.)
SB 396 Global Business Strategies (3 cr.)
MK 320 Principles of Marketing (3 cr.)
OM 476 Management of Technology (3 cr.) STS
OM 480 Project Management (3 cr.) EC
EC 360 Environmental Economics (3 cr.) EC/IG/UNIV; 2C
ES 438 Alternative Energy Systems (3 cr.)

4. ONE of the following courses (3 cr.)
UNIV 399 Global Experience (with Sustainable Solutions for the Developing World emphasis), recommended for all students; OR
A multidisciplinary project course (with Sustainable Solutions for the Developing World emphasis) if approved by the director of the minor and the chair or advisor for the student’s major program of study

Knowledge Areas
CGI Contemporary/Global Issues
EC Economics/Organizations
STS Science, Technology, and Society
CSO Cultures and Societies
IA Imaginative Arts
UNIV University Course
1C/2C Communication Point

The Adirondack Semester
Michael Dinan, Program Coordinator

Adirondack Semester - Clarkson University, through its Institute for a Sustainable Environment, has an off-campus, semester-long study in sustainability. The interdisciplinary and community-based program in Saranac Lake, N.Y., examines the affairs of society and the natural environment of New York’s Adirondack State Park. The Park is a living experiment in sustainability where nature, people and policy have come together in the largest protected area in the contiguous United States. Created by New York State in 1892, it is an unusual complex of over six million acres with approximately half of it owned by the citizens of New York State and the other half held privately.
Offered in both spring and fall semesters, a group of up to 12 students are in session with a diverse group of Clarkson faculty with specific interests, experience and scholarly work directly related to the Adirondack Park. Students and faculty engage with a professional network of people, businesses and agencies that shape policy, conduct business, and lobby at local and state levels. Students enjoy a classroom learning experience with professors and guest lecturers, which is complemented by scientific research in the field.

The semester consists of five three-credit courses providing the student with 15 300-level credits. The courses offered each semester vary slightly, with the fall semester more closely aligned with the engineering curriculum. Students experience the challenges and rewards of working cooperatively to research, analyze data and to generate answers to these problems. They seek out alternative methods and designs, emerging technologies and provide solutions that are innovative and/or unconventional. Paramount to the cause is a commitment to sustainability for society and nature.

**ISE Research**
Three of Clarkson University’s interdisciplinary research Centers are housed in the Institute: Center for Air Resources Engineering and Science (CARES), Center for Sustainable Energy Systems (CSES), and the Great Rivers Center. For information about the major research initiatives in the Institute, see http://www.clarkson.edu/ise/research.html.
INTERDISCIPLINARY PROGRAMS

In recent years, Clarkson University has built on its existing strengths in business, engineering, liberal arts, and the sciences to develop an increasing number of new interdisciplinary majors that combine learning from two or more traditionally distinct areas. Today, many of the most profound advances in knowledge are occurring at the intersections of previously separate academic disciplines and industrial fields. These innovative programs reflect not only the strength of the University’s academic faculty and resources, but also the flexibility and vitality of Clarkson’s highly collaborative academic environment.

Undergraduate Interdisciplinary Program Courses

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
<th>Courses</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>11-13</td>
<td>Clarkson Common Experience</td>
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<tr>
<td>Biology/Environmental Science</td>
<td>21</td>
<td>Technology course</td>
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<tr>
<td>Mathematics &amp; Statistics</td>
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<td>Professional Electives</td>
<td>12</td>
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<tr>
<td>Physics</td>
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<td>Free Electives</td>
<td>11-13</td>
</tr>
<tr>
<td>EHS/Industrial Hygiene</td>
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<td>Capstone Research</td>
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<tr>
<td>Policy Course</td>
<td>18</td>
<td>TOTAL</td>
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</tr>
</tbody>
</table>
BS in Engineering & Management
Amy K. Zander, Program Director
Misty Spriggs, Associate Director

Clarkson’s Engineering & Management (E&M) program is ideal for those who desire breadth and flexibility in a career centered on leadership and technology. The major was established in 1954 to meet the growing needs of industry for individuals with strong skill sets in both engineering and business. Graduates are prepared to integrate the rapidly changing technical and managerial aspects of an organization.

The E&M program utilizes Clarkson’s traditional strengths, stressing engineering principles and technical problem solving in conjunction with quantitative and qualitative managerial decision making. Students receive a balanced education involving course requirements from each of the major disciplines of engineering, business, science and liberal arts. The carefully planned curriculum is taught by faculty within their respective areas of expertise.

The Program Educational Objectives of the E&M program are to prepare students who within a few years of graduation:
- Apply technical problem solving skills to develop innovative, effective, and sustainable solutions to complex problems;
- Lead multi-disciplinary teams to success by managing team dynamics;
- Effectively communicate information for decision-making both orally and in writing to both technical and non-technical audiences;
- Continuously balance simultaneous demands of today’s global environment through multi-tasking capabilities of planning, organizing, managing and controlling resources;
- Combine engineering and business core knowledge and apply quantitative and qualitative methods to process analysis in business systems;
- Make timely, ethical and useful decisions in response to organizational challenges.

Typically, E&M students are people oriented, at ease with science and mathematics, and anticipate increasing managerial responsibilities over the course of their careers. Problem solving, communication and teamwork permeate the E&M curriculum. By design, the environment is one of collaborative teamwork and is known for strong mutual support among students. E&M graduates are recognized as leaders and facilitators who possess the ability to initiate new ideas and change.

The E&M program maintains two professional organizations and an E&M Student Advisory Council. Sigma Tau Iota, the E&M honorary society, consists of students enrolled in the program who display consistent academic excellence. The Engineering & Management Society regularly hosts business leaders and representatives who engage students in discussions that range from career opportunities to current industry trends and issues. The Student Advisory Council serves as a curricular advisory group and aids in assessment of the program outcomes.
Curriculum
The Engineering & Management program confers the Bachelor of Science (BS) degree upon completion of the 120 credit-hour program requirements. A candidate for the bachelor’s degree must not only pass all prescribed courses in the E&M curriculum, but must also meet all other graduation requirements and Clarkson Common Experience requirements stated in the Academic Requirements section of this catalog.

The Engineering & Management student is encouraged to use program professional electives to focus on specific career objectives. Students work closely with their advisor to select electives that best suit these objectives. Students often choose to pursue a minor in project management, a concentration in global supply chain management, or courses in construction management or manufacturing management.

Employment
Due to the program’s unique nature, and the quality and versatility of students attracted to it, E&M graduates are some of the most heavily recruited at Clarkson. For example, while the program’s enrollment represents roughly 10 percent of the student population, E&M seniors are typically invited to interview with nearly half of all companies recruiting at the on-campus Career Fair.

The career paths of E&M alumni reflect the breadth of the program’s curriculum and include:

Supply Chain Management
Consulting
Manufacturing and Production
Project Management
Marketing and Technical Sales
Quality Systems Management
Entrepreneurship
Applications Engineering
Field Service Engineering
Construction Management

Engineering & Management Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>EM205</td>
<td>Accounting for Decision Analysis</td>
<td>3</td>
<td>EM211</td>
<td>Intro to Enterprise</td>
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<tr>
<td>EM120</td>
<td>Team-Based Design &amp; Innovation$^{1,3}$</td>
<td>3</td>
<td>EM121</td>
<td>Technological Entrepreneurship$^{1,3}$</td>
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<td>UNIV190</td>
<td>Clarkson Seminar</td>
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<td>PY151</td>
<td>Intro to Psychology</td>
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<tr>
<td>MA131</td>
<td>Calculus I</td>
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<td>MA132</td>
<td>Calculus II</td>
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<td>CM131</td>
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<td>CM132</td>
<td>Chemistry II or</td>
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<td>FY100</td>
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<td>BY160</td>
<td>Cellular and Molecular Biology$^{5}$</td>
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<td>17 or 18</td>
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FIRST YEAR
Second Semester

$^{1,3}$ Indicates co-requisites that should be taken during these terms.
## SOPHOMORE YEAR

### First Semester

<table>
<thead>
<tr>
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<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>EC350</td>
<td>Economic Principles &amp; Engineering Economics</td>
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<td>ES220</td>
<td>Statics</td>
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<tr>
<td>LW270</td>
<td>Law &amp; Society</td>
<td>3</td>
<td>EM480</td>
<td>Project Management</td>
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<td>MA232</td>
<td>Differential Equations</td>
<td>3</td>
<td>STAT383</td>
<td>Applied Statistics I</td>
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<td>EM286</td>
<td>Organizational Behavior</td>
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<td>PH132</td>
<td>Physics II</td>
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<td>PH131</td>
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**Total Cr. Hrs.: 16**

### Second Semester

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<tr>
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**Total Cr. Hrs.: 19**

## JUNIOR YEAR

### First Semester

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<tr>
<td>ES330</td>
<td>Fluid Mechanics</td>
<td>3</td>
<td>FN361</td>
<td>Financial Management</td>
</tr>
<tr>
<td>EM333</td>
<td>Operations Research</td>
<td>3</td>
<td>EM331</td>
<td>Operations &amp; Supply Chain Management</td>
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<tr>
<td>MK320</td>
<td>Principles of Marketing</td>
<td>3</td>
<td>ES250</td>
<td>Electrical Science</td>
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<td>MA231</td>
<td>Calculus III</td>
<td>3</td>
<td>EM351</td>
<td>Quality Management &amp; Lean Enterprise</td>
</tr>
<tr>
<td>ES260</td>
<td>Materials Science or Professional Elective</td>
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<td>3</td>
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<td>ES222</td>
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<td>EE264</td>
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**Total Cr. Hrs.: 15**

### Second Semester

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<tr>
<td>ES340</td>
<td>Thermodynamics</td>
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<tr>
<td>EM432</td>
<td>Organizational Policy &amp; Strategy(^1)</td>
<td>3</td>
</tr>
<tr>
<td>Knowledge Area</td>
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<td></td>
</tr>
<tr>
<td>Professional Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM217</td>
<td>Public Speaking</td>
<td>12</td>
</tr>
</tbody>
</table>

## SENIOR YEAR

### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES453</td>
<td>Organizational Policy &amp; Strategy(^1)</td>
<td>3</td>
<td>EM456</td>
<td>Process Engineering &amp; Design(^1,3,4)</td>
</tr>
<tr>
<td>Knowledge Area</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Elective</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM217</td>
<td>Public Speaking</td>
<td>3</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Total Cr. Hrs.: 15**
Communications intensive (CI) – Students must earn a minimum of six (6) CI points outside of UNIV190 to meet graduation requirements.

Information technology-based courses

Technology course that meets CCE requirement

Students must take EM456 or another senior capstone design course approved by the Director of E&M.

Students who take BY160 rather than CM132 will need to complete one more credit of coursework to reach 120 credits.

See Academic Requirements for details of the Clarkson Common Experience including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements. Students are required to take five courses which cover four of the six specified CCE knowledge areas; one University course (UC) must span two Knowledge Areas.

Professional Experience Requirement is met when student completes EM120, EM121, EM432 and EM456 or the recognized equivalents of these courses. Beginning with the Class of 2017, all students will participate in a project-based professional experience such as co-op, internship, directed research or community project related to the student’s professional goals.

BS in Social Documentation Double Major
Bill Karis and Bill Vitek, Co-Directors

Students, whose interests are broad and flexible, with a broad span of interests, should consider Clarkson’s double major in Social Documentation (SD), combining majors in the Social Sciences (history, political science, anthropology and sociology) or Humanities (literature, film and philosophy) with a major in Communication & Media.

SD students express a desire to combine social, political or creative perspectives with mastery of sophisticated communication and recording technologies. They may be interested in historical preservation of the creative arts or creating oral and video histories of people or groups of people; they may be social or political activists who want to create the sound and video recordings and products that most effectively put their ideas before a contemporary audience.

Social Documentation emphasizes critical inquiries into societal issues as well as the study of recording and documenting theories, techniques and technologies. A substantive knowledge base in a social science or humanities discipline enables students to ground their communication degree in an area of interest that will also give them a distinctive perspective. Likewise, the critical thinking, persuasive, and media production skills learned from the communication program will empower the social science or humanities major to more effectively create products that can influence, entertain or educate. During their years at Clarkson, students will develop the ability to use sophisticated recording and communication technologies in order to better understand or advance a set of social, historical, political or creative interests or concerns.
Employment
After graduation, students can find careers in public or private radio or television broadcasting, in media-oriented firms, and within communications units in the public or private sector. Many public agencies are charged with handling electronic and publicly available data sets, and this double major also provides the basics for such a career choice. Some may choose to pursue independent work as filmmakers and writers.

Alternately, students may decide to go on to graduate school in a growing number of Social Documentation programs at universities like Duke, American or UC Santa Cruz. Others may choose from a wide array of master's programs, receiving degrees in fields as diverse as fine arts or business. Graduates can also opt for masters or doctoral programs in social sciences, communication or humanities.

Curriculum
Students choosing this double major will begin with the Clarkson Common Experience, as detailed in the Clarkson Catalog. Additionally, they will satisfy all the requirements for each major, also as detailed in the catalog. The following requirements are specific to Social Documentation, but most will also count as one of the requirements for one of the majors:

- History of Social Documentation, a three-credit hour gateway course to the major, will introduce basic concepts and stress the connections between the two majors;
- One three-credit hour research methods course, chosen from a list of approved courses;
- One three-credit hour film course, chosen from a list of approved courses;
- Two three-credit hour video production and digital design courses, chosen from a list of approved courses.
- Two senior capstone courses, SD480 and SD490, will generally be taken sequentially. These will replace each department's normal capstone course and are designed specifically for SD majors.

The sample curriculum below indicates some examples of the kinds of courses that might be chosen by Social Documentation double majors, though individuals will personalize their curricula in order to meet their specific educational and career goals.
Social Documentation Sample Curriculum

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
<th>Course</th>
<th>Title</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM214</td>
<td>Computer Applications in Media</td>
<td>3</td>
<td>COMM210</td>
<td>Theory of Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td>SD200</td>
<td>History of Social Documentation</td>
<td>3</td>
<td>COMM310</td>
<td>Mass Media and Society</td>
<td>3</td>
</tr>
<tr>
<td>MA180</td>
<td>Into College Mathematics</td>
<td>4</td>
<td>HIST391</td>
<td>Documenting Social Activism</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Common Experience Science Course</td>
<td>3</td>
<td>STAT282</td>
<td>General Statistics</td>
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<td>UNIV190</td>
<td>Clarkson Seminar</td>
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<td>Common Experience Science Course</td>
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<tr>
<td>SS120</td>
<td>Introducing the Liberal Arts</td>
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<tr>
<td>FY100</td>
<td>First-Year Seminar</td>
<td>1</td>
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**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Title</th>
<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>ANTH200</td>
<td>Intro. to Culture and Society</td>
<td>3</td>
<td>ANTH320</td>
<td>Racial Inequity in the US</td>
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<tr>
<td>COMM327</td>
<td>Digital Video Production I</td>
<td>3</td>
<td>COMM3xx</td>
<td>Professional Communication</td>
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<tr>
<td>COMM341</td>
<td>Introduction to Web Design</td>
<td>3</td>
<td>COMM427</td>
<td>Digital Video Production II</td>
<td>3</td>
</tr>
<tr>
<td>HIST320</td>
<td>Medicine and Society in America</td>
<td>3</td>
<td>FILM340</td>
<td>World in a Frame</td>
<td>3</td>
</tr>
<tr>
<td>PY151</td>
<td>Intro to Psychology</td>
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<td>Free Elective</td>
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15

15
### JUNIOR YEAR

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr.</th>
<th>Hrs.</th>
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</thead>
<tbody>
<tr>
<td>ANTH385</td>
<td>Food and Society</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM320</td>
<td>Photography</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM345</td>
<td>Information Architecture</td>
<td>3</td>
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<tr>
<td>POL351</td>
<td>Globalization</td>
<td>3</td>
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</tr>
<tr>
<td></td>
<td>Computer Course</td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<th>Hrs.</th>
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<tbody>
<tr>
<td>COMM221</td>
<td>2D Design</td>
<td>3</td>
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<td>COMM428</td>
<td>Public Debate and the Environment</td>
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<td>HIST395</td>
<td>Voices of the Past</td>
<td>3</td>
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<tr>
<td></td>
<td>Common Curriculum Technology Course</td>
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#### Total

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### SENIOR YEAR

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr.</th>
<th>Hrs.</th>
</tr>
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<tbody>
<tr>
<td>SD480</td>
<td>Research Project and Internship</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM410</td>
<td>Theory and Philosophy of Communication</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOC350</td>
<td>International Development and Social Change</td>
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<td></td>
<td>Free Electives</td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr.</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD490</td>
<td>Research Project and Internship</td>
<td>3</td>
<td></td>
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<tr>
<td></td>
<td>Free Electives</td>
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<td></td>
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#### Total

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<td></td>
<td>15</td>
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<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
BS in Software Engineering
The discipline of software engineering is concerned with the application of engineering principles to the construction of computer software. It addresses critical issues across the life cycle of a software product, beginning with a proposal to develop an application that requires computing resources and continuing through the development, testing, operation, and maintenance of the software product until it is retired.

The software engineer plays the role of the architect of a complex system. He or she takes into account the user requirements and needs, feasibility, cost, quality, reliability, safety, and time constraints. To do this, the software engineer has to be able to understand the application area that is the target of the desired software system, develop the software and ensure that it is reliable, and also manage the project so that it is produced in an economical, timely manner.

Objectives of the Clarkson Software Engineering Program
Software engineering graduates should be well prepared for a lifetime of professional activity, and the objective of our program is to build a foundation on which graduates can build successful careers. This means that, within a few years after completing the program, we expect that our graduates will be contributing professionals, effective and responsible collaborators. They should also have continued to grow intellectually and as well rounded citizens. This means graduates are expected to have
- Advanced their careers as contributing professionals who apply fundamental engineering knowledge and analytical problem solving skills in a wide variety of practical applications
- become well-rounded citizens who rely on their engineering education to serve society in an ethical and professional manner
- become effective and responsible collaborators who function well in diverse team environments, with some graduates having emerged as leaders in their field
- have exhibited intellectual growth and pursued continual innovation in their field, while those graduates who are especially talented and motivated to pursue a graduate degree should be or have been successful at entering and completing graduate studies

To attain these objectives, the curriculum is structured so that when a student graduates from the Software Engineering program, he or she will have gained the knowledge, skills, and attributes that provide a foundation on which a successful career in the Software Engineering profession rests. Our graduates will attain the following student outcomes:
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

In the context of the software engineering discipline, this means that graduates of the program will:

- have a fundamental understanding of computer systems
- be able to apply engineering principles to software design and construction, having developed the ability to:
  - develop software requirements and functional specifications
  - use proven techniques to design software structure before it is implemented
  - apply established verification and validation techniques
  - understand the importance of constructing large software systems using standardized components and reusing existing code (modules) where possible,
  - use software tools as effective aids in all phases of software development
  - design, develop, and deliver software in a cost effective manner
- have experience with issues encountered at every stage in the software life-cycle
- understand how to manage the development of software intensive systems
- be able to work on an interdisciplinary team of software components of a system
- have good interpersonal and communication skills
- be able to readily assimilate new technologies
- understand the impact their discipline has on society

Curriculum
To accomplish these goals, the curriculum is structured around a group of required courses in science, mathematics, and computer science and engineering. A variety of courses in the engineering sciences are included in the curriculum in order to provide exposure to application areas. Although there is ample opportunity for students to participate in team-based activities throughout the curriculum, each student’s program of study includes a major design experience in the senior year in which the student is required to bring together knowledge gained in a wide variety of courses to solve realistic problems, building significant applications in a team-based environment.

An Interdisciplinary Approach
Software Engineering is distinctive at Clarkson because it is interdisciplinary: we combine the expertise, knowledge, and experience of faculty from both the Electrical and Computer Engineering and the Computer Science Department. That benefits the students because they master the application of theory as well as knowledge and understanding of processes software process as they gain the ability to develop effective and cost-efficient software systems. Clarkson’s program is also designed to help students build interpersonal and communication skills that can launch a successful career in today’s world.
### Software Engineering Curriculum

**FIRST YEAR**  
*(See Common First-Year Curriculum in Engineering)*

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>MA232</td>
<td>Differential Equations</td>
</tr>
<tr>
<td>MA211</td>
<td>Foundations</td>
</tr>
<tr>
<td>ES250</td>
<td>Electrical Science</td>
</tr>
<tr>
<td>EE261</td>
<td>Intro. to Programming and Software Design or</td>
</tr>
<tr>
<td>CS141</td>
<td>Computer Science I</td>
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<tr>
<td>KA/UC Elective</td>
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<td><strong>Total</strong></td>
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<td><strong>Total</strong></td>
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#### JUNIOR YEAR

<table>
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<tr>
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<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
</tr>
<tr>
<td>STAT383</td>
<td>Applied Statistics or</td>
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<tr>
<td>MA381</td>
<td>Probability</td>
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<td>EE407</td>
<td>Computer Networks</td>
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<tr>
<td>EE363</td>
<td>Generic Programming &amp; Software Components</td>
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<tr>
<td>EE408</td>
<td>Software Design for Visual Environments</td>
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<tr>
<td>KA/UC Elective*</td>
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</tr>
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<td></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
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<tr>
<td>---------</td>
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</tr>
<tr>
<td>EE418</td>
<td>Senior Design</td>
</tr>
<tr>
<td>EE466</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>CS341</td>
<td>Programming Languages</td>
</tr>
<tr>
<td></td>
<td>Professional Elective</td>
</tr>
<tr>
<td></td>
<td>KA/UC Elective</td>
</tr>
</tbody>
</table>

* One of the KA/UC electives must be in economics.
Undergraduate Interdisciplinary Minors

Minor in Biomedical Engineering
As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minor in Biomedical Engineering enhances opportunities for Clarkson’s students to meet this need. This minor is connected closely with the minor in Biomedical Science and Technology. Students from both minors participate in shared core courses along with a multidisciplinary capstone design course. **Students can take only one (not both) of the two minors.**

A foundation knowledge of Calculus I & II (MA131/132), Physics I & II (PH131/132), and Biology II: Cell and Molecular Biology (BY160) is required for this minor.

**Requirements:**

**Physiology/Anatomy Requirement**
BY471 Anatomy and Physiology I
BY473 Anatomy and Physiology I Laboratory
OR
BYBY472 Anatomy and Physiology II
BY474 Anatomy and Physiology II Laboratory
OR
BY360 Human Physiology
BY362 Human Physiology Laboratory
BR200 Introduction to Biomedical and Rehabilitation Engineering, Science and Technology
BR450 Biomedical Engineering, Science, and Technology Capstone Design I or equivalent engineering design course with a BEST approved project
BR400 Biomedical Engineering

**Engineering Depth Elective**
Choose 1 (3 credits) from approved list of upper division courses.

**Breadth Elective**
Choose 1 (3 credits) from approved list of upper division courses.
The latest approved list of courses is available at the Center for Rehabilitation Engineering and Science (CREST) office.

**Proposed list of approved courses for Biomedical Engineering Minor**
(Prerequisites in parentheses)

**Choose One for Breadth Elective**
BY/CN314 Bioinformatics (BY160, BY214)
PH/CN426 Introduction to Biophysics (BY160 or BY312 or consent)
CM453 Introduction to Biomaterials (CM241, CM242)
PT360 Kinesiology I - Concepts of Human Movement (PH131 or PH141 or equivalent, and MA131 or MA180 or equivalent)
PT460 Kinesiology II - Functional Anatomy (PT360)
BY450 Biochemistry I (CM241 or consent)
BY/CN460 Neurobiology (BY160 or BY360 or consent)
PY/BY454 Physiological Psychology
Choose One for Engineering Depth Elective
ME380 Special Topics: BioMechanics (PH131, MA131)
CH465 Biochemical Engineering (CM241)
ES452 Biomaterials and Biomedical Applications (BY160, CM241 or ES260, and
CH301 or ES330 or consent) EE4XX Biomedical Signal Processing

Minor in Biomedical Science and Technology
As various fields of medicine and health care increasingly depend upon advances in technology, graduates
who possess combined expertise in engineering principles and knowledge of biological sciences at all levels
will be in high demand. The minor in Biomedical Science and Technology enhances opportunities for
Clarkson’s students to meet this need. This minor is connected closely with the minor in Biomedical
Engineering. Students from both minors participate in shared core courses along with a multidisciplinary
capstone design course. Students can take only one (not both) of the two minors.

A foundation knowledge of Biology II: Cell and Molecular Biology (BY160) is required for this minor.

Biology Fundamentals: Required (4 credits):
Physiology/Anatomy Requirement
BY471 Anatomy and Physiology I
BY473 Anatomy and Physiology I Laboratory
OR
BY472 Anatomy and Physiology II
BY474 Anatomy and Physiology II Laboratory
OR
BY360 Human Physiology
BY362 Human Physiology Laboratory

Engineering Fundamentals (3 credits)
BR200 Introduction to Biomedical and Rehabilitation Engineering, Science and Technology

Intersecting BEST courses, Required (3 credits)
(team taught, interdisciplinary)
BR450 BEST Capstone Design I (3 credits) or equivalent engineering design course with a BEST approved
project

Specialty Tracks (Tentative):
Choose one (2 course - 6 credits) track

Track I Genetic Engineering
BY214 Genetics
And choose one of

BY412 Molecular Biology Laboratory (4 credits)
BY/CM314 Bioinformatics
Track II Kinesiology
PT360: Kinesiology I - Concepts of Human Movement
PT460: Kinesiology II - Functional Anatomy (PT360)

Track III Neuroscience
BY/CM460 Neurobiology (BY160 or BY360 or consent)
PY458 Cognitive Neuroscience (PY151 or junior/senior standing)

Breadth Elective:
Choose 1 (3 credits) from approved list of upper division courses

Total: 19 credits (plus 3 credits cell biology)

Proposed list of approved courses for Biomedical Science and Technology Minor (Prerequisites in parentheses)
Examples include:
Choose one.
BY450 Biochemistry I (CM 241 or consent)
BY350 Comparative Anatomy (BY160 or consent)
BY320 Microbiology (BY160, BY214 and CM 132 or CM104 or consent)
BY312 Advanced Cell Biology (BY160/162 or consent)
PT360 Kinesiology I - Concepts of Human Movement (PH131 or PH141 or equivalent, and MA131 or MA 180 or equivalent)
PT460 Kinesiology II - Functional Anatomy (PT360)
BY/CM314 Bioinformatics (BY160, BY214)
PH/CM426 Introduction to Biophysics (BY160 or BY312 or consent)
CM453 Introduction to Biomaterials (CM241, CM242)
PY/BY454 Physiological Psychology
PY358 Cognitive Neuroscience (PH151 or junior/senior standing)
PY359 Perception (PH151 or consent)
PY360 Learning and Memory (PH151 or junior/senior standing)
PY463 Health Psychology (PY151 or junior/senior standing)
SB305 Cost Management
SB322 Designing and Leading Innovative Ventures
MK321 Consumer Behavior
OS466 Negotiations and Relationship Management
Other programs can submit courses appropriate to this minor.
Minor in Software Engineering
A minor in Software Engineering is available to students in any degree program with the exception of the Software Engineering and Computer Science degree programs. To obtain a minor, a student must complete the following course requirements:

a. (CS141, CS142, and CS344) or (EE261, EE361, and EE363)
b. CS242 or EE408
c. EE368 or CS350
d. EE465/CS452, CS455/EE407, EE468/CS460, or other course approved by the Software Engineering Program Committee.

Interdisciplinary Undergraduate ISE Programs
The Institute houses two interdisciplinary undergraduate degree programs: the BS in Environmental Health Science and the BS in Environmental Science & Policy. For information about these programs see the Undergraduate Institute for Sustainable Environment program section of the Catalog.

NONDEGREE GRANTING DEPARTMENTS

Reserve Officers’ Training Corps
ROTC at Clarkson University is an elective course of study that provides college-trained officers to the United States Army and Air Force. Upon graduation and successful completion of either the Army program in Military Science or the Air Force program in Aerospace Studies, students receive appointments as commissioned officers at the rank of second lieutenant. Each program provides a Basic Course in the first and sophomore years, and an Advanced Course in the junior and senior years. Sophomores who did not participate during their first two years may qualify for admission into the Army Advanced Course by attending a special, expenses-paid, four-week Leader’s Training Course in the summer prior to their junior year. There are other entry options available for veterans and graduate students. Students may enroll in the ROTC Basic Course without incurring any military service obligation.

Admission to junior and senior (300- and 400- ) level classes is contingent upon successful completion of first-year and sophomore curriculum (or its equivalent) and qualifications in leadership, academic proficiency, and physical fitness. In special situations, students may qualify for admission into 300- and 400-level curriculum by meeting other criteria. Academic credit toward graduation requirements for Military Science and Aerospace Studies courses is determined by the individual schools at Clarkson. Interested individuals should contact the Professor of Military Science or the Professor of Aerospace Studies.

Uniforms and books required for ROTC courses are furnished free of charge to students in the Basic and Advanced Courses. Advanced-course students are currently paid a $450-500 per month (tax-free) stipend on a 10-month-per-year basis to offset living costs. Additionally, qualified students are eligible to compete for Army and Air Force scholarships.

Military Science (Army ROTC)
LTC Abrahm DiMarco — Chair & Professor of Military Science; Mr. Scott Toth, Assistant Professor of Military Science
The Clarkson University Army ROTC Golden Knight Battalion was founded in 1936 to enable Clarkson students to earn commissions as second lieutenants in the United States Army. Since then, it has commissioned over 1,300 leaders into the Active Army, Reserve, and National Guard components. Today, the Golden Knight Battalion continues to commission high-quality officers not only from Clarkson, but also from St. Lawrence University, SUNY Potsdam, and SUNY Canton.

The goal of the department is to develop outstanding scholar-athlete-leaders. The specific training you receive in Army ROTC will teach you leadership development, ethics, military law, training management, communications and fitness. This will take place both in the classroom and hands-on in the field, but you will have a normal daily schedule like all college students.

Army ROTC is an integral part of campus life, and cadets are active in all campus activities, including student government, varsity athletics, and Greek organizations. The battalion is approximately 100 cadets strong, and its focus remains on the development and training of America’s future leaders.

The Program
The ROTC program complements the traditional college curriculum by emphasizing development of the student’s leadership, management and interpersonal skills through dynamic instruction and challenging, experiential training. This is accomplished through a two-stage curriculum: Army ROTC Basic Course and Advanced Course.

The first stage, or Basic Course, takes place during your first two years in college as elective courses. It involves one elective class and lab each semester. You will learn basic military skills, the fundamentals of leadership and start the groundwork toward becoming an Army leader. You can take Army ROTC Basic Courses without a military commitment.

The second stage, or Advanced Course, takes place during your last two years in college as elective courses. It includes one elective class and lab each semester, plus a summer leadership course. You will learn advanced military tactics and gain experience in team organization, planning and decision-making. Entering the Advanced Course requires a commitment to serve as an Officer in the U.S. Army after you graduate.

Every Army ROTC cadet who enters into the Advanced Course attends the Leadership Development and Assessment Course. It is a four-week summer camp to evaluate and develop all Army ROTC cadets. This camp takes place between your junior and senior years of college, and is conducted at Fort Lewis, Washington.

Cadets also attend a weekly leadership lab that complements classroom instruction with experiential learning. Leadership labs focus on the practical application of recent instruction. Labs include a leadership reaction course, land navigation, rappelling, small unit tactics, and drill and ceremonies. Once each semester, cadets may participate in an extended two-day field training exercise, designed to challenge each cadet’s leadership and military skills.

The Golden Knight Battalion also sponsors other events during the year such as a military ball and athletic events. Cadets may also compete to attend the Airborne, Air Assault, Mountain Warfare, and Northern
Warfare schools during the summers. After the junior year, cadets may volunteer for summer training internships in locations throughout the United States, Europe and Korea.

Upon graduation and satisfaction of ROTC requirements, cadets are commissioned as second lieutenants into one of 16 specialized branches in Active Army, Army Reserve or National Guard.

**Scholarships**

Army ROTC offers a wide range of scholarships for interested and competitive students. Four-, three- and two-year scholarships are awarded to students on a merit basis. Students may apply for four-year scholarships while still in high school, as well as two three-year and four-year scholarships once on campus. These scholarships include:

- full tuition and educational fees;
- $1,200 per year for textbooks and classroom supplies;
- $300-500 per month (tax-free) spending money for up to 10 months per year; and
- Clarkson offers all scholarship recipients a Clarkson ROTC Incentive Scholarship to be used to defray the costs of room and board. This scholarship is worth over $14,000 annually. This incentive is worth over $8,000 annually.

Scholarship applicants are evaluated on a number of areas that include: SAT/ACT performance, high school or college grade-point average, athletic ability and performance, participation in extracurricular activities, and leadership potential.

**Facilities and Equipment**

The Golden Knight Battalion has access to special equipment and training facilities that are second to none. On campus, cadets train in a 47-acre area of wooded forest, containing a rappel tower, grenade assault course, land navigation course, and field leadership reaction course. Additionally, students train at Fort Drum, New York, the home of the Army’s 10th Mountain Division, located just 60 miles from the Clarkson campus.

**Other Activities**

There are many extracurricular activities open to ROTC cadets, including the Ranger Challenge Team and Club, Color Guard, Cadet Association, Army 1-Miler Team, Clarkson Guard and Intramural Teams. Some of these groups compete against other universities and ROTC programs in military and athletic competitions. The Cadet Color Guard performs at home hockey games, commissioning and graduation ceremonies, and other official events.

**Leadership Training**

No other college programs offer leadership training that is comparable to Army ROTC. An Army ROTC student knows how to lead, manage and work with people. Whether you decide on the Army as a career, or use it as a stepping stone to other goals in life, you will have a competitive advantage because you will learn what it takes to lead!
Military Science Curriculum *

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<th>FIRST YEAR</th>
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* Courses may be applicable as free electives in some majors where noted. Consult individual departments for details.

For More Information
If you have any questions or would like to speak with someone about Army ROTC, contact the Golden Knight Battalion at 315-265-2180 (collect) or 315-268-7705 or e-mail armyrotc@clarkson.edu. You can also visit our Web site at www.clarkson.edu/armyrotc.
Aerospace Studies (Air Force ROTC)
Lt Col Jennifer Amato — Chair and Professor of Aerospace Studies

Air Force Reserve Officer Training Corps (AFROTC) combines college study with military leadership, discipline, and training to produce officers and leaders for the United States Air Force. Upon graduation with at least a bachelor’s degree, students are commissioned as second lieutenants in the active duty Air Force. A commission is an appointment to a military officer by the President of the United States.

Curriculum
AFROTC is normally a four-year program divided into two portions, the General Military Course (GMC) for freshmen and sophomores, and the Professional Officer Course (POC) for juniors and seniors. All students also complete Leadership Laboratory (LLAB) each semester.

General Military Course (GMC)
The GMC involves a one credit hour course and a two-hour Leadership Laboratory each semester. The freshman curriculum introduces the Air Force mission and organization, covers the basics of military customs and courtesies, military correspondence styles, and drill and ceremonies. The sophomore curriculum focuses on the history of air power, starting with the Wright Brothers’ first flight at Kitty Hawk, and traces the evolution of aircraft and Air Force missions throughout WWI, WWII, Korea, Vietnam, the Gulf War, and recent operations around the world such as Afghanistan and Iraq.

Field Training
After successful completion of the GMC, students are normally scheduled to attend Field Training during the summer between the sophomore and junior year. Field Training is an intense, four-week, hands-on leadership challenge. Cadets will be evaluated on their mastery of military customs and courtesies, drill and ceremonies, and on their leadership ability. Cadets are exposed to a variety of challenges to force them to work as a team, learn to critically evaluate situations, and perform under stress. While no cadet will tell you it is fun, Field Training is often a life-changing experience that builds self-confidence and fine-tunes leadership skills.

Professional Officer Course (POC)
After successfully completing Field Training, cadets are sworn in to the POC and are enlisted in the inactive reserves while they complete their final two years of college. The junior curriculum focuses on an in-depth study of leadership and management concepts. The senior curriculum continues to emphasize leadership, but introduces national security concepts and issues, cultural awareness, military law, the law of armed conflict, and preparation for entrance into the active duty Air Force. POC cadets are placed in leadership positions and are charged with running the cadet wing that is modeled after the organizational structure of the active duty Air Force.

Leadership Laboratory (LLAB)
LLAB is a hands-on leadership training program. The POC plan and execute 13 labs in which the GMC are instructed in skills they will need to successfully complete Field Training and for a thriving military career. POC members are responsible for planning and executing LLAB, as well as other extracurricular activities like formal dinners and awards ceremonies. Cadets are challenged in the classroom, and their jobs in the
cadet wing require them to put the theories into practice. Cadets are also expected to participate in 2 hours of Physical Training (PT) per week during each semester.

Scholarships
Merit-based tuition scholarships are available to AFROTC cadets; they vary from $3,000 to full tuition. Below is a list of current scholarships.
• TYPE I — Full tuition and fees scholarship
• TYPE II — $18,000 towards tuition and fees
• TYPE III — $9,000 towards tuition and fees
• TYPE VI — $3,000 towards tuition and fees
• TYPE VIII — A competitive-based academic upgrade of a TYPE II, pays up to 80% of tuition

Other Benefits — All scholarships include the following:
• Free room and board (Clarkson incentive)
• Monthly Stipend during the academic year — FR = $300, SOPH = $350, JUN = $450, SEN = $500
• $300 per semester for books

For more details, contact the Aerospace Studies Department at 315-268-7989.

Aerospace Studies Curriculum*

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AS303  Leadership Laboratory  0  AS304  Leadership Laboratory  0

**SENIOR YEAR**

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* Course may be applicable as free electives in some majors where noted. Consult individual departments for details.

**Physical Education**

Steve Yianoukos — Chair; Director Bill Bergan; Instructors are the Division 3 Head Coaches.

Physical Education offers an array of optional courses that vary based upon student interest and the season. The program is designed to offer a variety of activities in individual, lifetime and team sports which augment the required Personal Wellness course. Special attention is given to those activities with significant carry-over values for lifelong participation.

**Optional Physical Education Courses**

Optional physical education courses include Weight Training Techniques, EMT/CPR Lifesaving, Golf, Racquetball, Aerobic Fitness, and Badminton.

In cooperation with the University medical staff, the Physical Education Department will assist those students who are physically disabled to design a program best suited to their capabilities.

The Henry R. Hodge Sports and Recreation Complex is located adjacent to the residence halls and offers facilities for team and recreational activities. Included in the complex are the Alumni Gymnasium; the Fitness Center; the Schuler Recreation Building, which houses the Stephenson Field House and the Fuller Pool; and the Snell Athletic Fields. Other fields, some lighted, are also available for athletic and recreational use.

The Department of Athletics and Recreation offers a number of summer camp opportunities. Please contact them directly at 315-268-6622 or visit them on the Web at http://www.clarksonathletics.com/ for more details.
DIVISION OF RESEARCH
Gregory C. Slack, Director of Research and Technology Transfer; Anthony Adamczyk, Assistant Director of Research and Technology Transfer; Anna Marie Dawley Grant and Contract Administrator; Todd C. Travis, Award Administrator

The Division of Research (DOR) is the central office charged with overseeing the conduct and promotion of research activities at Clarkson University. It is the philosophy of the University that research supports and enhances its educational mission. The DOR strives to provide and constantly enhance services to the Clarkson community as well as individuals and companies that come in contact with the Division. Examples of such services include proposal development for faculty and staff; administration of grants and contracts established under federal, state, and private awards on behalf of the University; assurance of compliance with federal, state, private, and other regulations pertaining to grant sponsorship activities at the University; and the creation, submission, or provision of analyses, reports or policies as required. Through these activities, the DOR promotes innovation and creativity, thereby increasing knowledge and making the knowledge available and useful for scholarship and education.

Some typical areas of sponsored research in engineering and science include: crystal growth, aerosol kinetics and scavenging, light scattering, stability of colloidal dispersion, strength of materials, metallic systems, ceramic surfaces, phase transitions, bio-engineering, heat transfer and mass transfer, thin film adsorption, film flow stability, transition and turbulence and active flow control, nonlinear wave motion, dynamical systems, chaos and control, computational applied math, optimization and numerical p.d.e.s., wave forces, surface shear viscosity, nutrient regeneration in lakes, flow slides, copper and zinc protein, nanotechnology, artificial intelligence, oxygenation of metal complexes, asynchronous networks, communication networks, detection of random signals, renewable energy production, power transmission, energy conversion, plasma deposition, osmotic work, and corrosion.

In the business area, studies have been conducted relative to dispute settlement techniques, scientific and technical information systems, effects of organizational changes, economic impact of environmental damage from acid rain, marketing approaches, pricing environmental alternatives, banking systems, and monetary policies.
ACADEMIC CENTERS

CENTER FOR ADVANCED MATERIALS PROCESSING (CAMP)
A New York State Center for Advanced Technology
Marilyn Miller Freeman, Director

The Center for Advanced Materials Processing (CAMP), throughout its history, has been a valuable and strong partner for companies interested in understanding and exploiting state-of-the-art advanced, tailor-designed materials and processes to improve products, solve manufacturing challenges, increase yield, lower costs, and establish novel products. CAMP focuses on bringing together faculty and student researchers from science and engineering to promote innovation based on interdisciplinary synergy.

Since its inception in 1986, CAMP has been dedicated to developing Clarkson’s research and education programs in cutting edge materials development and materials processing. The Center builds on scientific and technological expertise of faculty members in fields related to physicochemical properties of colloids and interfaces, nanostructured materials, surface science, polymers and biomaterials, materials processing, chemical mechanical polishing/planarization (CMP) for silicon wafers and novel substrates, microencapsulation and computational modeling of transport processes.

CAMP was designated a New York State Center for Advanced Technology (CAT) in 1987 and has continued to have renewed standing as a designated NYSTAR CAT through the present.

CAMP sponsored activities at Clarkson include undergraduate projects, educational lectures and seminars by international experts, special short courses, and research by graduate students, research associates, and visiting scientists from around the world. The mission of CAMP is –

- To form alliances with industry, corporations and government entities in the state of NY (and elsewhere) to assist them in applying science, engineering and technology development to improve their products, maintain their competitive edge, and foster economic development.
- To perform innovative research on, demonstration of, and technology transfer of new technologies related to the synthesis and processing of advanced materials of value to industry and corporations.
- To prepare students (undergraduates and graduates) to enter the workforce with an excellent education and research/development experience gained through hand-on research on projects of importance to industry and corporations.

As one of 15 Centers for Advanced Technology (CATs) at New York State universities, CAMP is funded by the New York State Office of Science, Technology and Academic Research (NYSTAR). This funding is used in support of projects across campus in applied research, materials characterization and analysis and technology transfer in support of New York State companies’ economic growth and development. Every year CAMP is responsible for several million dollars in positive economic impact. In addition, CAMP-related research is also funded by private industry and the Federal government.
Center for Innovative Device Technologies  
Vladimir Privman, Director  

The Center’s research focuses on the device science of novel information processing and on the engineering approaches that offer alternatives and new capabilities for the computer, sensor and biosensor technologies in commercial use. This research involves synergistic collaborations across disciplines, between engineers and scientists, and serves as a catalyst to form dynamic teams of researchers.

The enabling role of the Center is to provide a synergistic unit for organizing faculty-teams aimed at research collaborations and project development. The Center activities include mentoring students/researchers, organization of conferences, sponsorship of conference sessions and scientific journal issues in relevant research topics, and participation in research endeavors that transcend single-investigator projects.

Center for Air Resources Engineering and Science (CARES)  
Thomas M. Holsen, Director; Suresh Dhaniyala, Co-Director  

The presence of contaminants in the atmosphere can produce a wide variety of adverse effects including increased adverse public health effects, decreased visibility, deterioration of buildings and monuments, acidification of lakes and rivers, and forest and crop damage. The health effects of atmospheric contaminants cannot be avoided by staying inside since ambient air is transported indoors along with its pollutants while indoor sources can add to the problems. Although we have substantially improved the ambient air quality over the past 35 years, there are still a number of problems that are attributed to air pollution. Recent studies have found strong correlations between changes in particle concentrations and increased mortality. There has been a sharp rise in childhood asthma, and many areas of the country continue to fail to meet national ambient air quality standards. Worldwide much of the world's air quality fails to meet the quality specified by the World Health Organization's guidelines.

Clarkson University has significant resources in people and equipment to bring to bear on the management of air pollution. These resources have been combined with those of a consortium of universities and research organizations to form the Syracuse Center of Excellence in Environmental and Energy Systems (CoEEES). CoEEES brings together multidisciplinary teams of investigators to measure, model, and suggest implementation strategies that will lead to improved atmospheric conditions including the ambient atmosphere, indoor atmospheres in homes and hospitals, and controlled atmospheres in commercial manufacturing operations and office workplaces. In this process, we are developing new modeling, measurement, and flow management tools that can provide the base for new or expanded commercial ventures as well as providing critical information to state and federal regulatory authorities that will help to improve the quality of life for New Yorkers. CARES is the center that brings together the world-class expertise that is available at Clarkson as part of CoEEES. Our expertise is focused in air sampling and analysis, receptor modeling, atmospheric deposition, and the application of experimental and computational fluid dynamics to air pollution problems. CARES laboratory and office space, and equipment including an aerosol wind tunnel, a high-speed aeronautical wind tunnel, a Beowolf computer cluster, field sampling systems, and analytical equipment are available to programs at Clarkson and throughout CoEEES’s other participating institutions.
Center for Sustainable Energy Systems
Kenneth Visser, Director

Clarkson University has been engaged in energy research and education for over 30 years and our faculty’s wide range of interests and activities span disciplines from Engineering to Business. The Center provides a vehicle to bring these efforts together, exchange ideas with each other and generate new concepts for innovative, sustainable, collaborative projects at local, national and international levels. The Center also supports the current efforts of the Institute for a Sustainable Environment (ISE) and the Center for Advanced Materials Processing (CAMP) and is closely linked to the Shipley Center for Innovation.

Great Rivers Center
Michael Twiss, Director

Clarkson University faculty and researchers have a distinguished history of investigating and engineering solutions to a broad range of issues involving the lower Great Lakes and St. Lawrence River. Clarkson is best known for contributing to the solution of environmental problems such as eutrophication, toxic chemical pollution, and corrective measures to remediate contaminated environments; to the solution of water resources management concerns related to navigability for commerce and power generation, especially as affected by winter conditions and the formation and dynamics of ice; and for addressing socioeconomic issues such as binational trade and cultural concerns.

These activities have been undertaken by teams comprising faculty members, graduate students and undergraduates using Clarkson facilities and often involving collaborators from several other universities in New York State via the Great Lakes Research Consortium. Not only do these efforts create new knowledge that is essential to the education of students who pursue BS, MS, M.E. and PhD degrees and to the professional development of the faculty members, this work provides environmental and economic benefits to the people of the region, the nation and, indeed, the international community.

Recognizing the multiplicative effect of interdisciplinary collaboration, in 1999 Clarkson initiated actions that resulted in the establishment of the Great Rivers Center on the Clarkson campus. The Great Rivers Center is integrated into the education, research and outreach missions of the Clarkson Institute for a Sustainable Environment.
Center for Rehabilitation Engineering, Science and Technology (CREST)
Charles Robinson, Director

The Center for Rehabilitation Engineering, Science and Technology was established at Clarkson University in 2005. Its mission is to educate, mentor and train students to be able to integrate and apply a combined scientific, analytic, technological and business approach to emerging biomedical engineering and biomedical science areas. It is of note that biomedical engineering is the most rapidly growing field of engineering, with outstanding biomedical job prospects, and with half of the undergraduates being female, a ratio that exists in no other biomedical discipline.

The Center for Rehabilitation Engineering, Science and Technology takes a unique approach to the study of rehabilitation problems. First, through its focus on biomedical engineering, the Center studies how the nervous and skeletal muscle systems of the human body normally work. Secondly, through its rehabilitation science and technology components, it models the mechanisms by which these systems become impaired through disease or injury. Within its rehabilitation technology aspects, the Center investigates how technology can help to restore or replace functions such as hearing, speaking, seeing or moving through the use of artificial assistive or substitutive devices. Through a clinical link with Clarkson’s Physical Therapy program, the Center investigates the outcome of the applications of this assistive technology. The Center also organizes and presents seminars, campus lectures and classroom discussions by visiting leaders in the field of rehabilitation.

Medical and health care have become increasingly technology-based in recent years, with an increased demand for engineers with skills that integrate engineering principles with an understanding of the human physical and psychosocial characteristics. The Center for Rehabilitation Engineering, Science and Technology offers a concentration in Biomedical and Rehabilitation Engineering to meet this need. Obtaining an engineering degree with a concentration in biomedical and rehabilitation engineering is an attractive opportunity for university bound engineering students who have a strong desire to use their talents to improve the quality of life for people with medical conditions or disabilities. Clarkson offers this concentration to augment a degree from a traditional engineering department. This concentration is multi-disciplinary, and will include courses from multiple schools or departments across the University. The Biomedical and Rehabilitation Engineering Concentration is just one of the examples addressing Clarkson’s Coulter School of Engineering’s motto “Technology Serving Humanity.”

REH Center
Shipley Center for Innovation
Matthew Draper, Executive Director, Gabor Forgacs, Scientific Director

The Shipley Center for Innovation is a University-wide resource dedicated to bringing Clarkson innovations to market, gaining recognition for the technology created by our faculty and students, and creating local jobs for graduating Clarkson students. The Center will serve as an engine for economic development in the North Country by engaging in the creation of new enterprises that capitalize on emerging technologies.

The Shipley Center for Innovation is comprised of a business incubator which provides tools needed for the emerging technologies to be commercialized and developed into profitable companies. Workshops are also developed to assist with future technology.
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Associate Professor of Communication & Media

STAIGER, Annegret
Vordiplom Biology, Georg August Universität, Göttingen, Germany
M.A., PhD, University of California, Santa Barbara
Associate Professor of Anthropology

SVOBODA, James
BSE.E., General Motors Institute
MSE.E., PhD, University of Wisconsin
Associate Professor and Associate Chair of Electrical and Computer Engineering /
Executive Officer Emeritus

TAMON, Christino
BS, University of Calgary
M.Sc., University of Toronto
PhD, University of Calgary
Associate Professor of Computer Science
TURNBULL, Alasdair
BS, Mount Allison University
M.B.A., PhD, University of Western Ontario
Associate Professor of Economics and
Financial Studies

VISSER, Kenneth
BS, University of Calgary
MS, PhD, University of Notre Dame
Associate Professor of Mechanical and
Aeronautical Engineering

WALLACE, Kenneth
BS, University of Rochester
PhD, Ohio State University
Associate Professor of Biology

Wilton, M. Lori
BS, Andrews University
MS, Andrews University
DPT, Creighton University
PhD, Nova Southeastern University
Associate Professor of Physical Therapy

WASHBURN, Brooks
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M.A. Harvard University

WASSERMAN, Michael
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PhD, Michigan State University
Associate Professor of Consumer and
Organizational Studies

WILKE, Andreas
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Germany
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WOJTKIEWICZ, Steven
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Engineering

WU, Lei
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Shaanxi, China
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YU, Zhenxin
BE, Xi’an Jiao tong University, China
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MS, PhD Washington University in St. Louis
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Information Systems

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PhD, Rensselaer Polytechnic Institute
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Aeronautical Engineering

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Diego
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Financial Studies

ASSISTANT PROFESSORS

AHMED, Usman
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M.B.A., Lahore University, Pakistan
PhD, York University, Canada
Assistant Professor of Engineering and
Management

AIDUN, Rashid
Adjunct Associate Professor
Mechanical & Aeronautical Engineering

ALMOMANI, Ahmad Rasheed
Visiting Assistant Professor of Mathematics
ANDRIANO, Joseph  
Assistant Professor of Economics and Financial Studies  

ATEMS, Bebonchu  
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M.A., PhD, Kansas State University  
Assistant Professor of Economics and Financial Studies  

BALL, Jennifer  
B.A., Saint Vincent College  
M.A., PhD, Purdue University  
Assistant Professor of History  

BAILEY, Susan  
BS, McMaster University  
MS, University of Calgary  
PhD, University of Ottawa  
Assistant Professor of Biology  

BANAVAR, Mahesh Krishna  
Assistant Professor of Electrical and Computer Engineering  

BANERJEE, Natasha  
BS, MS, Rochester Institute of Technology  
PhD, Carnegie Mellon University  
Assistant Professor of Computer Science  

BANERJEE, Sanjib  
BS, MS, PhD, West Virginia University  
Assistant Professor of Electrical and Computer Engineering  

BELLONA, Christopher  
BS, Western Washington University  
MS, PhD, Colorado School of Mines  
Assistant Professor of Civil and Environmental Engineering  

Bogolyubova, Olga  
BS Saint-Petersburg State University, Russia  
PhD Saint-Petersburg State University, Russia  
Visiting Assistant Professor, Psychology  

BOOLANI, Ali  
B.A., Tulane University, New Orleans, LA  
M.A., Tulane University, New Orleans, LA  
M.Ed., University of New Orleans, LA  
Ph.D, Oklahoma State University  
Post-doctoral, University of Georgia, Athens, GA  
Assistant Professor of Physical Therapy  

BUDISIC, Marko  
BS, University of Zagreb, Croatia  
PhD, University of California, Santa Barbara  
Assistant Professor of Mathematics  

CHO, Na-Eun  
BS, University of Washington  
MBA, Yonsei University  
Ph.D, University of Michigan  
Assistant Professor Consumer & Organizational Studies  

CIANI, Mario  
BS, SUNY University of Albany  
MS, University of Bridgeport  
D.C., New York Chiropractic College  
Assistant Professor of Occupational Therapy  

DAVID, Andrew  
BS, St. Johns University  
MS, Hofstra University  
PhD, Stellenbosch University  
Assistant Professor of Biology  

DONG, He  
BS, MS, Tsinghua-University, Beijing China,  
PhD, Rice University  
Assistant Professor of Chemistry and Biomolecular Science  

DU, Yuncheng  
Assistant Professor Chemical & Biomolecular Engineering
ERATH, Byron
BS, Brigham Young University
MS, Purdue University
PhD, Purdue University
Assistant Professor of Mechanical and Aeronautical Engineering

FADDA, Roberto
D.D.S., University of Ferrara
M.D., University of Ferrara
Assistant Professor of Physician Assistant Studies

GIBERT, James
BS, MS, PhD, Clemson University
Assistant Professor of Mechanical and Aeronautical Engineering

Giffin, Adom
BS, Lawrence Technological University
MS, PhD, SUNY Albany
Assistant Professor of Mathematics

GOSHKO, Laura
BS Pharmacy, University of Connecticut
MS, University of Connecticut
Clinical Assistant Professor of Physician Assistant Studies

GOULET, Paul
BS, PhD, University of Windsor, Ontario
Assistant Professor of Chemistry and Biomolecular Science

HAUSER, Brian
B.A., M.A., PhD, Ohio State University
Assistant Professor of Film

HE, Ying
B.A. Wuhan University
MS Bowling Green State University
PhD University of Florida
Assistant Professor of Mathematics

HEALEY, Gregory
Adjunct Clinical Assistant Professor
Physician Assistant Studies

HOFFMANN, Claudia
B.A., University of Hamburg
M.A., Purdue University
PhD, University of Florida
Assistant Professor of Film

HONGAY, Cintia
BS, Suffolk University
PhD, Harvard University
Assistant Professor of Biology

JOYCE, Terri
BS, Hahnemann University
M.P.A.S., University of Nebraska Medical Center
Clinical Assistant Professor of Physician Assistant Studies

KANTARCI, Burak
BSc Istanbul Technical University
MSc, Istanbul Technical University
Ph.D, University of Ottawa, Canada
Ph.D, Istanbul Technical University
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KNACK, Ian
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MS, Clarkson University, Potsdam
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KNACK, Jennifer
B.A., St. Bonaventure University
MS, PhD, University of Texas at Arlington
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KRAUS, Petra
Assistant Professor of Biology
PhD University of Ulm, Germany (Molecular Genetics & Human Biology)
KRING, Stefanie  
BS, SUNY Potsdam  
BS, MS, PhD, Clarkson University  
Assistant Professor of Biology

KRYSTOF, Leo  
CPT., U.S. Army  
BS West Point Military Academy  
Assistant Professor of Military Science

LAFAY, Vicki  
BS, Ithaca College  
DPT, SUNY Upstate Medical University  
Director of Clinical Education /Clinical  
Assistant Professor of Physical Therapy

LEE, Alex  
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MS, PhD, University of Memphis  
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B.P.S., MS, Clarkson University  
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B.A., Eastern Connecticut State University  
M.A., University of Delaware, 2012  
Ph.D, University of Delaware, 2016  
Assistant Professor of Sociology

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MHS, Washington University  
DPT, Massachusetts General Hospital Institute of Health Professions  
PhD, Syracuse University  
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MARQUEZ-ILLESCAS, Gilberto  
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M.A., Universidad Carlos III de Madrid  
Msc., Universidad Carlos III de Madrid  
PhD, Universidad Carlos III de Madrid  
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MARTINEZ LEON, Hilda  
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M.S, Tecnologico de Monterrey  
D.Sc. Tecnologico de Monterrey  
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Neil '64 and Karen Bonke Assistant Professor of Engineering Management

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SUR, Shantanu
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THOMAS, Joshua
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Assistant Studies

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ZHOU, Linying
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M.A., PhD, University of California at San Diego
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INSTRUCTORS

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PhD, University of Bucharest, Romania
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MS University of Missouri – Rolla
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BUCKINGHAM, Ronald
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BUCKLE, Karen
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BURDICK, Karen
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CHAPMAN, Elisabeth
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Data Analytics

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Director of Media Creation and Production

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HEINL, Jared
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JOHNS, Danielle
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BS, University of Illinois, Urbana  
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School of Business

RILEY, Charles  
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Beacon Institute

SEKELJ, Gasper  
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SIMON, Judith  
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SMITH, Brad  
B.A., SUNY Potsdam  
M.A., SUNY Potsdam  
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SUMANASOORIYA, Milani  
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SZARKA, Andrew  
Adjunct Instructor  
Humanities & Social Sciences

TIGHE, Michael  
Assistant Instructor of Biology

TIRION, Monique  
Adjunct Research Associate Professor

WEST, Summar  
Visiting Assistant Professor  
Humanities & Social Sciences

WIGGINS, Arderrick  
Instructor of Military Science

WULTSCH, Elisabeth  
Instructor of School of Engineering

ZROKA, Amy  
Adjunct Instructor  
Humanities & Social Sciences
# Academic Calendar

## Semester Programs

### Fall Semester Events

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Residential Business Program Classes Begin</td>
<td>22 Aug M</td>
<td>21 Aug M</td>
<td>20 Aug M</td>
</tr>
<tr>
<td>New Student Check-In</td>
<td>26 Aug F</td>
<td>25 Aug F</td>
<td>24 Aug F</td>
</tr>
<tr>
<td>Returning Student Check-In</td>
<td>28 Aug SU</td>
<td>27 Aug SU</td>
<td>26 Aug SU</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>29 Aug M</td>
<td>28 Aug M</td>
<td>27 Aug M</td>
</tr>
<tr>
<td>Fall Recess Begins*</td>
<td>7 Oct F</td>
<td>6 Oct F</td>
<td>5 Oct F</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>12 Oct W</td>
<td>11 Oct W</td>
<td>10 Oct W</td>
</tr>
<tr>
<td>Parent's/Family Weekend Begins</td>
<td>28 Oct F</td>
<td>TBA</td>
<td>TBA</td>
</tr>
<tr>
<td>Enrollment For Spring Classes Begin</td>
<td>9 Nov W</td>
<td>8 Nov W</td>
<td>7 Nov W</td>
</tr>
<tr>
<td>Thanksgiving Recess Begins*</td>
<td>22 Nov TU</td>
<td>21 Nov TU</td>
<td>20 Nov TU</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>28 Nov M</td>
<td>27 Nov M</td>
<td>26 Nov M</td>
</tr>
<tr>
<td>Last Day of Class</td>
<td>9 Dec F</td>
<td>8 Dec F</td>
<td>7 Dec F</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>12 Dec M</td>
<td>11 Dec M</td>
<td>10 Dec M</td>
</tr>
<tr>
<td>Exams End</td>
<td>16 Dec F</td>
<td>15 Dec F</td>
<td>14 Dec F</td>
</tr>
<tr>
<td>December Graduates Recognition Ceremony</td>
<td>17 Dec SA</td>
<td>16 Dec SA</td>
<td>15 Dec SA</td>
</tr>
<tr>
<td>Final Grades Due to SAS — Noon</td>
<td>19 Dec M</td>
<td>18 Dec M</td>
<td>17 Dec M</td>
</tr>
</tbody>
</table>

### Spring Semester Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Spring 2017</th>
<th>Spring 2018</th>
<th>Spring 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Residential Business Program Classes Begin</td>
<td>9 Jan M</td>
<td>8 Jan M</td>
<td>7 Jan M</td>
</tr>
<tr>
<td>New Student Check-In</td>
<td>10 Jan TU</td>
<td>9 Jan T</td>
<td>8 Jan TU</td>
</tr>
<tr>
<td>Returning Student Check-In</td>
<td>11 Jan W</td>
<td>10 Jan W</td>
<td>9 Jan W</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>12 Jan TH</td>
<td>11 Jan TH</td>
<td>10 Jan TH</td>
</tr>
<tr>
<td>February Break Begins*</td>
<td>22 Feb W</td>
<td>21 Feb W</td>
<td>20 Feb W</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>27 Feb M</td>
<td>26 Feb M</td>
<td>25 Feb M</td>
</tr>
<tr>
<td>Midterm Grades Due to SAS — Noon</td>
<td>20 Mar M</td>
<td>12 Mar M</td>
<td>11 Mar M</td>
</tr>
<tr>
<td>Graduate Residential Business Program Spring Recess Begins*</td>
<td>3 Mar F</td>
<td>9 Mar F</td>
<td>8 Mar F</td>
</tr>
<tr>
<td>Spring Recess Begins*</td>
<td>17 Mar F</td>
<td>16 Mar F</td>
<td>15 Mar F</td>
</tr>
<tr>
<td>All Classes Resume</td>
<td>27 Mar M</td>
<td>26 Mar M</td>
<td>25 Mar M</td>
</tr>
</tbody>
</table>
Enrollment For Fall Classes Begin
Last Day of Class
Reading Days
Exams Begin
Exams End
Final Grades Due to SAS 5 p.m.**
Commencement

**Summer Sessions**

<table>
<thead>
<tr>
<th>Summer 2017</th>
<th>Summer 2018</th>
<th>Summer 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1 Begins</td>
<td>22 May M</td>
<td>21 May M</td>
</tr>
<tr>
<td>Session 1 Ends</td>
<td>24 June SA</td>
<td>23 June SA</td>
</tr>
<tr>
<td>Session 2 Begins</td>
<td>3 July M</td>
<td>2 July M</td>
</tr>
<tr>
<td>Session 2 Ends</td>
<td>5 Aug SA</td>
<td>4 Aug SA</td>
</tr>
</tbody>
</table>

Alumni Reunion Dates

7/13-7/16 7/12-7/15 7/11-7/14
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Clarkson University does not discriminate on the basis of race, gender, color, creed, religion, national origin, age, disability, sexual orientation, veteran or marital status in provision of educational or employment opportunities. Clarkson University does not discriminate on the basis of sex or disability in its educational programs and activities, pursuant to the requirements of Title IX of the Educational Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, and the American Disabilities Act of 1990 respectively.

This policy extends to both employment by and admission to the University. Inquiries concerning Section 504, and the Americans with Disabilities Act of 1990, should be directed to Loren Nowak, Section 504/ADA Coordinator, Director of Accommodative Services, 1400 Educational Resource Center, Clarkson University, Box 5635, Potsdam, NY 13699; or telephone 315-268-7643. Information on the processing of grievances and charges relating to the above policies can be obtained from the Affirmative Action Officer, Clarkson University, Box 5542, Potsdam, NY 13699, or telephone 315-268-6497.

Inquiries concerning Title IX, the Age Discrimination Act, or other discrimination concerns should be directed to Jennifer Ball, Title IX Coordinator, Clarkson University, Box 5750, Potsdam, NY 13699; or telephone 315-268-4208 or jball@Clarkson.edu

Clarkson University is making a special effort to identify a broad spectrum of candidates in both employment and educational programs, including women, minorities, and people with disabilities.

Student Complaint Process (HEOA)
In compliance with the Higher Education Opportunity Act of 2008 and the state complaint processes as prescribed for under 34 CFR 600.9, the following resources are provided:

Filing a Grievance with NY State
New York State Education Department
Office of College and University Evaluation
EBA Room 969
89 Washington Avenue
Albany, New York 12234

Filing a Grievance with Appropriate State Education Departments/Agencies/Officials - All States

Campus Crime Statistics
The Advisory Committee on Campus Safety will provide upon request all campus crime statistics
as reported to the United States Department of Education. Contact the Director of Campus Safety & Security, 315-268-6666, or visit www.clarkson.edu/campussafety.

Protection of Privacy
Clarkson University abides by the provisions of the Family Educational Rights and Privacy Act of 1974 (Buckley Amendment). The University will release or withhold information under these provisions, which are published annually in the Clarkson Regulations.

Nonimmigrant Alien Students
Clarkson is authorized under federal law to enroll nonimmigrant alien students.
LIST OF DEGREE PROGRAMS & HEGIS CODES

The number following the degree program is the Higher Education General Information Survey (HEGIS) code for classifying academic areas designated by the New York State Education Department. Enrollment in other than registered or otherwise approved programs may jeopardize a student’s eligibility for certain student aid awards.

Undergraduate Degree Programs

SCHOOL OF BUSINESS
Bachelor of Science
Global Supply Chain Management 0509
Innovation and Entrepreneurship 0506
Financial Information and Analysis 0504
Business Intelligence and Data Analytics 0599
Engineering and Management 4904

WALLACE H. SCHOOL OF ENGINEERING
Bachelor of Science
Aeronautical Engineering 0902
Chemical Engineering 0906
Civil Engineering 0908
Computer Engineering 0999
Electrical Engineering 0909
Environmental Engineering 0922
Mechanical Engineering 0910

SCHOOL OF ARTS AND SCIENCES
Bachelor of Science
Applied Mathematics and Statistics 1703
Biology 0401
Biomolecular Science 0499
Chemistry 1905

Communication 0601
Computer Science 0701
Digital Arts and Sciences 0605
History 2205
Humanities 1501
Interdisciplinary Liberal Studies 4901
Interdisciplinary Social Sciences 2201
Mathematics 1701
Physics 1902
Political Science 2207
Psychology 2001

Institute for a Sustainable Environment (ISE)
Bachelor of Science
Environmental Science and Policy 0420
Environmental Health Science 0426

INTERDISCIPLINARY
Bachelor of Science
Software Engineering 0999
(See ISE for additional Programs)

Bachelor of Professional Studies
Individually Designed Program 4999