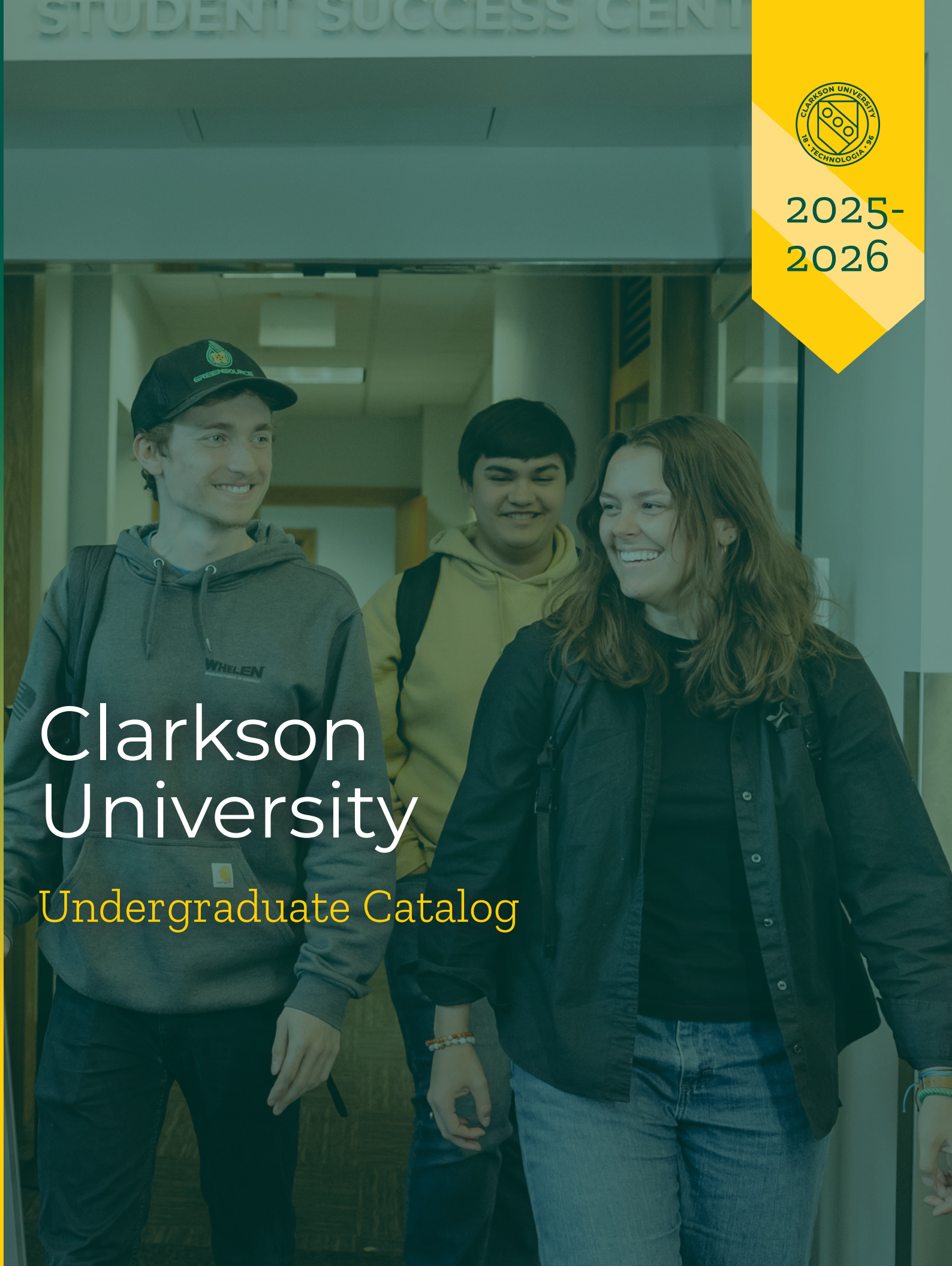

2025-2026

Clarkson University

Undergraduate Catalog

CLARKSON UNIVERSITY
UNDERGRADUATE CATALOG
2025-2026

David D. Reh School of Business
Wallace H. Coulter School of Engineering and Applied Sciences
Lewis School of Health and Life Sciences
Interdisciplinary Signature Programs
www.clarkson.edu

Clarkson University is a nationally ranked research university and the institution of choice for more than 4,000 enterprising, high-ability scholars from diverse backgrounds who embrace challenges 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 48,000 strong alumni, one in five is in the C-suite, 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. The University also includes The Capital Region Campus for graduate education in the Capital Region of New York.

Clarkson's educational strengths include:

- rigorous professional preparation
- dynamic, real-world learning
- highly collaborative community
- teamwork that spans disciplines

Changes in Curricula

Information contained in this catalog is current at the time the catalog is posted on our Website, 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 Graduate School, Student Achievement 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 courses are offered are accessible in Clarkson's Student Information System. 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 may be viewed here:

https://mycu-g.clarkson.edu/psp/guest/EMPLOYEE/SA/c/SA_LEARNER_SERVICES.SSS_BROWSE_CATLG_P.GBL?

Course credit is also available for Independent Study and Special Projects.

Accreditation

Clarkson is accredited by the Middle States Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104-2680, 215-662-5606.

The undergraduate programs in aerospace, chemical, civil, computer, electrical, environmental, mechanical, and software engineering are accredited by the Engineering Accreditation Commission of ABET, https://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 David D. Reh School of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB), an internationally recognized accrediting agency for graduate and undergraduate programs in business administration.

The Healthcare Management MBA is accredited by the Commission on the Accreditation of Healthcare Management Education (CAHME).

The entry level doctor of physical therapy program is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE) of the American Physical Therapy Association (APTA). The Accreditation Review Committee (ARC-PA) on Education for the Physician Assistant has granted continuing Accreditation to the Physician Assistant Studies Program. The Occupational Therapy Program is fully accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA).

In addition, the University 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.

Student Retention and Persistence

Retention studies of independent institutions in New York State show on average that 73.7 percent of students who enter as freshmen complete their degrees within six years, and 61.8 percent in four years. At these same schools, the sampling of transfer students shows 67.4 percent completing their degrees in four years and 71.3 percent in six years.

At Clarkson the graduation rate is well above the norm: averaged among those completing degrees over the past three years, 76.2 percent of freshmen completed their studies for a bachelor's degree within six years; 74.4 percent in five years; and 63.6 percent in four years or less. *Among transfer students, 48.4 percent complete their bachelor's degrees in two years and 80.0 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 72.5 percent.

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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 teachers/scholars aspires to offer superior instruction and engage in high-quality research and scholarship in engineering, business, science, health, education 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:

1. 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;
2. Develop and refine exceptional communication skills with an awareness of potential cultural differences;
3. Lead effectively and work productively within disciplinary and multidisciplinary teams composed of members with diverse interests and backgrounds;
4. Excel in using computing and information technologies;
5. 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:

1. 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;
2. 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;
3. Use our campus as a living laboratory to improve learning, and uses the wider region to broaden and extend Clarkson's outreach and service;
4. Provides personal advising and interaction with faculty and staff as well as supportive relationships among students;
5. Offers many leadership opportunities through co-curricular groups and activities;
6. 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 University is a proven leader in technological education, research, innovation and sustainable economic development. With its main campus in Potsdam, N.Y., and additional education and research operations online and in the Capital Region. Clarkson faculty have a direct impact on more than 3,800 students annually through nationally recognized undergraduate and graduate STEM-designated degrees in engineering, business, science and health professions; executive education, industry-relevant credentials and K-12 STEM programs. Alumni earn salaries among the top 2% in the nation; one in five already leads in the C-suite.

Founded in 1896 with a compelling charge to serve the real needs of the American people, Clarkson cultivates an innovative and interdisciplinary research environment focused on rapidly solving real-world problems for a better future. Example signature areas of research include STEM and entrepreneurial education, healthy global solutions, computational and data-enabled discovery, advanced materials development, and next-generation medicine and healthcare. Our external network has more than 380 active partners in industry, government agencies, chambers of commerce and research organizations, affording students access to world-relevant problems to pursue with their professors as well as a direct pipeline to internships and careers after graduation. In addition to an engaged 48,000+ strong alumni community in 87 countries, our global reach extends through our schools, ROTC command, research centers and institutes, and across more than 40 international university exchange partners.

Here is a sample of the external accolades:

1. Clarkson alumni salaries rank in the top 2 percent of highest salaries in the United States, Payscale College Salary Report
2. Best 390 Colleges & Best Value Colleges,Princeton Review
3. Top 250 Colleges 2025, Forbes
4. Top-tier National University & Top 50 Best Values in Higher Education, U.S. News & World Report, America's Best Colleges
5. Top 40 Best Salaries, Wall Street Journal/College Pulse 2025 Best Colleges
6. Best Colleges for Veterans, U.S. News & World Report, America's Best Colleges
7. One of America's Best Colleges and ranked 4.5 out of 5 stars for value, Money's Best Colleges 2025

Clarkson's major organizational units are the Academic Affairs Signature Programs, the David D. Reh School of Business, the Wallace H. Coulter School of Engineering and Applied Sciences, the Earl R. and Barbara D. Lewis School of Health and Life Sciences, the Institute for a Sustainable Environment, the Graduate School, the Institute for STEM Education, Sponsored Research Services, and The Clarkson School, a unique early college program for talented high school age students.

Wallace H. Coulter School of Engineering and Applied Sciences
Representing the highest percentage of student enrollment, the Wallace H. Coulter School of Engineering and Applied Sciences has faculty and staff in the Departments of Chemical & Biomolecular Engineering, Civil & Environmental Engineering, Electrical & Computer Engineering, and Mechanical & Aerospace Engineering, Physics, Chemistry and Biochemistry, Mathematics, Computer Science. Faculty and students also participate in the engineering & management, software engineering and undergraduate interdisciplinary minors.

In spring 2002, Clarkson announced that the Wallace H. Coulter Foundation had made a $30 million philanthropic gift to the University to support the ongoing excellence in its engineering and science programs. The gift honors the late Wallace H. Coulter, a past trustee and research partner of the University, and reinforces a theme he embraced, “Technology Serving Humanity.”

David D. Reh School of Business
Named in 2017 for David D. Reh ’62, H’17, the mission of the Reh School of Business is to combine scholarly research and teaching to create and advance knowledge at the intersection of business, technology and society. With faculty and staff supporting students, the Reh School focuses on areas that span traditional boundaries: global supply chain management, innovation & entrepreneurship, financial information & analysis, business analytics, and business administration. The engineering & management program, which is among a limited number of programs worldwide that enjoys dual accreditation by both engineering and business agencies, is also administered from the Reh School with close alignment to the Coulter School. Reh students start their own business as first-year students, engage in an international experience, participate in an internship or co-op and develop expertise in traditional business disciplines — accounting, economics, finance, marketing, management, operations and data analytics — while gaining perspective on how they fit together.

Lewis School of Health and Life Sciences
Through a transformational gift in 2019 from Earl and Barbara Lewis, Clarkson University established the Earl R. and Barbara D. Lewis School of Health Sciences to prepare the next generation of healthcare and life science leaders. Through immersive learning and an innovative curriculum, the Lewis School delivers the highest quality education for its students while tackling today’s biggest healthcare challenges—locally and globally.. The Lewis School of Health and Life Sciences currently consists of three graduate-level programs: physical therapy, physician assistant and occupational therapy and three undergraduate programs: Biology, Healthcare and Psychology.

The Department of Arts, Culture and Technology
The Department of Arts, Culture, and Technology underpins the Clarkson Common Experience Curriculum and is the genesis of how students gain value-added experience in communicating ideas effectively.

The Institute for a Sustainable Environment (ISE)
ISE facilitates boundary-spanning environmental research, educational activities and external partnerships. Students from across campus can integrate sustainability into their curricular or co-curricular education by adding minors, implementing sustainability projects on campus, and participating in research. The Institute also supports Clarkson's significant resources focused on managing pollution and measuring contaminant concentrations in environmental media. This includes the Center for Air and Aquatic Resources Engineering and Sciences (CAARES), which brings together expertise focused on environmental sampling and analysis, receptor modeling, analytical chemistry, atmospheric deposition, and the application of experimental and computational fluid dynamics to pollution problems.

The Center of Excellence in Healthy Water Solutions is a New York State-funded CAT that supports interdisciplinary research and industry collaborations to generate solutions that help protect and improve waters for sustainable natural environments, healthy populations, resilient communities and sound economies.

Institute for STEM Education
Clarkson's Institute for STEM Education spans boundaries across the University's other institutes and schools through formal and informal educational outreach, educational and pedagogical research, and the scholarship of teaching and learning, as well as through the recruitment, retention, and persistence of STEM students, and collaboration with educational and basic research initiatives. The Institute supports a nationally recognized training program for STEM graduate students to prepare for teaching and advising roles, delivers multiple STEM enrichment programs for K-12 students and teachers across the state, and offers Clarkson faculty and community members opportunities to connect, reflect, and focus on their teaching practices and student experiences.

The Honors Program
The Honors Program is a "community within a community," offering a select group of talented and highly motivated students an intimate, supportive, and enriched Clarkson experience. Students in the Honors Program are diverse, nationally and ethnically, with about equal numbers of women and men and representing all majors at Clarkson. Founded in 1997, the Honors Program takes the undergraduate experience to an entirely new level. Clarkson is famous for its hands-on, problem-based curriculum, but the Honors Program provides even more opportunities to conduct original research or independent projects; experience internships, co-ops or study abroad placements; and work in teams on real-world problems. Acceptance to the Honors Program is highly competitive.

The Clarkson School
The Clarkson School is a selective early-college program that engages approximately 60 talented and motivated high school students who enroll as first-year university students at Clarkson. Taking the same courses as undergraduates and accessing all the same

support services, clubs and activities, “Schoolies” live in a special living-learning community that provides additional support for personal growth, academic achievement and professional development.

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 smiting, 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 1919 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. The Women’s Hockey Team is 3 time NCAA national champions in 2014, 2017, and 2018.

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 then 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 engineering, Clarkson Hall for electrical engineering, 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. In 2017, #ClarksonIgnite was introduced as a new approach and catalyst for exploring, creating and achieving what's next. Through a renovation to the Schuler Educational Resource Center, an Innovation Hub was created to ignite connections across academic disciplines, cultures and industries to create the entrepreneurial mindset, knowledge and intellectual curiosity needed to innovate world relevant solutions.

In 2016 The University welcomed a Graduate School campus in New York's Capital Region that takes advantage of all that New York's Capital Region has to offer.

ACADEMIC PROGRAMS

Bachelor's Degree Majors
All bachelor's 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. Program length for a bachelor of science degree is four years.

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:

David D. Reh School of Business	
Business Administration	Financial Information & Analysis
Business Analytics	Global Supply Chain Management
Engineering & Management	Innovation & Entrepreneurship

Wallace H. Coulter School of Engineering and Applied Sciences	
Aerospace Engineering	Computer Science
Applied Mathematics & Statistics	Data Science
Biochemistry	Electrical Engineering
Chemical Engineering	Environmental Engineering
Chemistry	Mathematics
Civil Engineering	Mechanical Engineering
Computer Engineering	Physics

Institute for a Sustainable Environment (ISE) & Interdisciplinary Programs	
Environmental Science & Sustainability	Software Engineering

Lewis School of Health and Life Sciences

Biology	Business of Biotechnology
Healthcare	Healthcare Business
Psychology	

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.

Architectural & Facilities Engineering	Individually Designed Minor
Bioethics	Information Technology
Biology	International and Cross-Cultural Perspective
Biology, Behavior & Society	Law Studies
Biomedical Engineering	Literature & the Arts
Biomedical Science & Technology	Manufacturing Engineering
Business	Mathematics
Chemistry	Materials Engineering
Cognitive Neuroscience	Medicine and Healthcare
Communication	Military Leadership Studies
Computational Science	New Product Development and Marketing
Computer Science	Physics
Digital Art	Project Management

Economics	Psychology
Electrical Engineering	Robotics
Engineering Science	Science, Technology and Society
Environmental Engineering	Social Justice
Environmental Health & Safety	Software Engineering
Environmental Policy	Statistics
Environmental Science	Sustainable Energy Systems Engineering
Gender & Sexuality Studies	Sustainable Solutions
Health Psychology	Thematic & Disciplinary Minors
Human Resources Management	War Studies

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 advisors.

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:

1. Mastery of a major field of study;
2. Effective communication in oral, written, and technological forms, critical and imaginative thinking; and
3. Problem solving skills using both quantitative and qualitative reasoning where appropriate

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

1. An increased understanding of and insight into his or her own behavior
2. An appreciation of the need for self-motivated life-long learning
3. An increased social awareness and interpersonal competence, including an appreciation for the value of experiencing diversity; and
4. 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:

1. The nature of culture and societies
2. Contemporary and global issues
3. The imaginative arts and their role in society
4. Science and technology, including their relationship to society and their impact on the environment
5. Economic and organizational concepts and decision-making; and
6. 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:

1. Learning to communicate effectively
2. Developing an appreciation for diversity in both working and living environments
3. Recognizing the importance of personal, societal, and professional ethics
4. 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 UNIV 190, 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 of two (C1 or C2) to indicate the extent of communication experience in that course. Beyond UNIV 190, 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 UNIV 190. 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 UNIV 190, 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
FY 100, First Year Seminar. First Year Seminar treats personal and social adjustment topics as well as Clarkson values, ethics, and diversity.

UNIV 190, 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 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.

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:

1. Cultures and Societies (CSO)
2. Contemporary and Global Issues (CGI)
3. Imaginative Arts (IA)
4. Science, Technology, and Society (STS)
5. Economics and Organizations (EC)
6. 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 communication 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.

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 2.000 cumulative average
3. At least a 2.000 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 Requirements

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 UNIV 190, or any course assigned one or two communication points.

NOTE: 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.

ACADEMIC AFFAIRS & SIGNATURE PROGRAMS

Academic Affairs and Signature Programs support the many functions that contribute to the academic mission of the University through teaching, research and scholarship, and academic service.

Student Achievement Services

Amanda Pickering, Associate Vice President of Academic Affairs & Student Achievement

The Student Achievement Services (SAS) Office serves as the University's central resource for academic and administrative support. SAS provides comprehensive services related to course enrollment, academic records, grading, transcript requests, the academic calendar, student financials, and other essential student processes.

In addition to transactional services, SAS staff conduct thorough reviews of matters involving student billing, financial aid, and academic progress. Through this integrated approach, the office supports student retention, degree completion, and preparation for professional success.

The SAS team of professional specialists applies a concierge-style advisement model designed to guide students through degree planning, connect them with appropriate University resources, and ensure timely access to information that supports academic, financial, and long-term achievement.

Student Records

Kara Pitts, University Registrar
Angela Shatraw, Associate Registrar
Michelle Huto, Assistant Registrar

Grading System

Grades are reported in accordance with the following system:

A+	Passed with 4.000 quality points per credit hour
A	Passed with 4.000 quality points per credit hour
A-	Passed with 3.667 quality points per credit hour
B+	Passed with 3.334 quality points per credit hour
B	Passed with 3.000 quality points per credit hour
B-	Passed with 2.667 quality points per credit hour
C+	Passed with 2.334 quality points per credit hour
C	Passed with 2.000 quality points per credit hours
C-	Passed with 1.667 quality points per credit hours

D	Lowest passing grade with 1.000 quality points per credit hour
F	Failed with 0.000 quality points per credit hour

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 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 is 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, quality point average not affected.

Academic Standing

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.
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.
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.
To be continued, if separated	An undergraduate must request continuance by submitting a request for continuance form available in myCU. 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 form which can be found on the website at https://www.clarkson.edu/continuance-and-readmission 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 on continuance require approval of the University's Continuance and Readmission Committee. If continued, a student's academic standing will be Academic Probation

The Academic Standing acquired at the end of the semester shall take effect at the beginning of the next summer school or semester in which the student enrolls.

Although a student's GPA may subsequently change due to courses being repeated or omitted, academic standing will not change; academic standing is based solely on the original semester performance. Further information may be found in the Undergraduate Regulations Section III-R, Academic Standing.

Undergraduate Academic Honors
An undergraduate student must be enrolled in at least 14 credits, of which 12 or more must be for letter grade, and receive no failing grades in order to qualify for the Dean's List or as a Presidential Scholar.

a. A student is eligible for the academic Dean's List in any semester in which they earn at least a 3.250 quality-point average.
b. A student is eligible for the Presidential Scholar List in any semester in which they earn at least a 3.800 quality-point average.
c. Cross-registered course work is considered transfer credit and therefore credits taken cannot be used to qualify for Dean's List or Presidential Scholar Honors.

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.

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.

Scholarships and Financial Assistance
Nicole Adner, Financial Aid Director

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 outside scholarship opportunities through their high school guidance offices as well as Federal, State, and alternative/private educational loan opportunities.

Prospective U.S. first year students who wish to be considered for aid from Clarkson must complete the following:

1. File a completed application for admission by January 15th of the final year of secondary school
2. File the free Application for Federal Student Aid (FAFSA) by February 1st. The preferred and easiest method to apply is online at https://studentaid.gov/h/apply-for-aid/fafsa. 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 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.

Retention requirements for financial aid vary depending upon the source and type of aid-federal, state or institutional. Students must maintain Satisfactory Academic Progress 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.

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 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 Scholarship
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 January 15.

Clarkson FIRST Scholarship
This award recognizes select high school seniors who have participated on a FIRST Robotics (FRC) or Tech Challenge (FTC) team. Scholarships range from $1,000 - $6,000 annually. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 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 January 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 January 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 January 15.

SAGE Tuition Rewards (Saving 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 $6,000 per year scholarship based on academic record and scholarship application. Any major may apply. Submit the scholarship application online at https://www.waceinc.org/scholarship/index.html. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Young Entrepreneurs and Young Innovators Program
Prospective students who are selected into these programs at the Young Entrepreneurs and Innovation 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 a $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 Scholarships
For transfer students only. Amounts vary.

Alumni Connection Awards

Holcroft Alumni Recognition Awards
Awards based on strong potential for success and the recommendations 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 January 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 $1,000 Alumni Legacy Scholarship. Only one scholarship will be granted regardless of how many qualifying family members you have.

Early Decision Incentive Scholarship
An additional $8,000 scholarship is available exclusively to Early Decision applicants. The scholarship is split evenly over 4 years/8 semesters of undergraduate study ($2,000 per year/$1,000 per semester).

To qualify students must apply to Clarkson via Early Decision Admission no later than December 1 of the senior year of high school. Be a new incoming freshmen applicant.

Submit the Early Decision Admission deposit within 2 weeks of receiving the Financial Aid Award Notice (extenuating circumstances will be evaluated on a case by case basis).

Heintzelman Cape Cod Scholars Program

This program is for high achieving Cape Cod, Massachusetts high school students. The program provides a $50,000 scholarship split evenly over 4 years/8 semesters ($12,500 per year) of undergraduate study at Clarkson University. An application is required.

Clarkson Visit Scholarship

Clarkson offers a $500 renewable Visit scholarship to any student who has an official undergraduate admission visit to our Potsdam, NY campus. Visits must be completed no later than January 15 of the senior year of high school.

Qualifying visits include personalized visits set up directly through the Undergraduate Admissions Office, pre-arranged overnight admission visits for accepted students, Summer Visit Day, Fall Open House, Spring Accepted Students Day, and Group Visits to campus set up directly through the Undergraduate Admissions Office.

Conrad Foundation Scholarships

The Conrad Foundation and Clarkson University have partnered together to offer 2 scholarships:

1. Conrad Foundation Spirit of Innovation Scholarship - all Conrad Challenge participants with the exception of the finalists, are awarded $12,000 per year for a total value of $48,000 over four years.
2. The Conrad Challenge Scholarship - the finalists of the Conrad Challenge receive $15,000 per year, for a total value of $60,000 over four years.

To qualify you must apply for admission and have participated in at least one year of the Conrad Challenge. You must notify us of your participation by December 15th if you are applying for early decision admission and January 15th for regular decision admission.

For the Conrad Challenge Scholarship, you must have been named a finalist in the Conrad Challenge in any year. You may only receive one scholarship regardless of the number of years you have participated.

The Conrad Foundation is a nonprofit organization dedicated to promoting collaborative, student centered, real world-relevant learning that fosters innovation and entrepreneurship.

The Conrad Challenge is an international, team-based competition for students ages 13-18 to innovate new products and services that address global issues in one of six categories.

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 $5,665 annually for up to 8 semesters. No repayment is required. Students must file a FAFSA application and an Express TAP Application (ETA) at https://www.hesc.ny.gov/ 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:

Calendar: Semester Program: Baccalaureate									
Program Prior being certified for this payment:									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th**	10th**
A student must have accumulated this many credits:									
0	3	9	21	33	45	60	75	90	105
With at least this grade point average:									
0	1.1	1.2	1.3	2.0	2.0	2.0	2.0	2.0	2.0

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:

Calendar: Semester Program: Baccalaureate									
Program Prior being certified for this payment:									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th**	10th**
A student must have accumulated this many credits:									
0	6	15	27	39	51	66	81	96	111
With at least this grade point average:									
0	1.5	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0

Other NYS Scholarships
New York State offers other scholarships in addition to TAP. Visit 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 non-repayable 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:

1. Type I : Tuition and mandatory fees for a full-time student
2. Type II : $18,000 towards tuition
3. Type III : $9,000 towards tuition
4. Type VI: $3,000 towards tuition
5. Type VIII: 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 tuition and mandatory fees benefit.. Winners will also receive a book allowance of $1,200 per year and a tax-fee 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 the average cost of room and board for an 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%.

In accordance with Title 38 US Code 3679 subsection (e), Clarkson University adopts the following additional provisions for any students using U.S. Department of Veterans Affairs (VA) Post 9/11 G.I. Bill® (Ch. 33) or Vocational Rehabilitation and Employment (Ch. 31) benefits, while payment to the institution is pending from the VA. Clarkson will not:

- Prevent, nor delay the student's enrollment;
- Assess a late penalty fee to the student;
- Require the student to secure alternative or additional funding;
- Deny the student access to any resources available to other students who have satisfied their tuition and fee bills to the institution, including but not limited to access to classes, libraries, or other institutional facilities.

However, to qualify for this provision, such students are required to provide a Certificate of Eligibility to the School Certifying Official no later than the first day of class.

Part-Time Student 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 Achievement Services is able to assist interested students find employment at the University.

Clarkson Payment Plan (PP)
Clarkson provides a 4-month payment plan per term, an option attractive to many families. The maximum amount to be financed is the total charges less estimated financial aid, and the minimum amount is $1,000 per term. The PP is available with no finance or interest charges, provided payments are made in accordance with the terms of the contract.

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 specific 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. Barno ’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
Robert and Elaine Birrell Endowed Scholarship
Joseph I Bishop ’61 Endowed Scholarship
Bart Blaner '83 Endowed Scholarship
Professor Owen E. Brady III Endowed Scholarship
Andrea K. Bridge ’68 and John E. O’Beirne Endowed Presidential Scholarship
Bradford Broughton Technical Communications Endowed Scholarship Fund
Robert Brunner, Jr. '83 Memorial 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
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
Castrinovo Endowed Scholarship
Tony /54 and Carol Cecere Endowed Scholarship
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
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
Cristo Endowed Scholarship
Clarkson University Pep 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
Benson G. Diefendorf Endowed Scholarship
Louis ’54 and Joan Dino Endowed Scholarship
James L. Dohr Accounting Scholarship Fund Dolphin Legacy Endowed Scholarship
Brendan Donohue ’84 Memorial Endowed Scholarship Fund
Richard C. ’55 and Joy M. Dorf Endowed Scholarship Fund
Glendon '79 and Margaret Duclos Endowed Scholarship
John M. ’59 and Joyce A. Eikenberg Endowed Scholarship
Dave ’69 M’75 and Debi Elkins Scholarship Endowed Fund
Arthur ’47 and Dorothy Engle Distinguished Scholarship Fund
Emerson Foundation Matching Grant for Endowed Presidential
Scholarships Allen ’44 and Kathleen Fales Endowed Scholarship
Famigghia Castronovo/Carrington Endowed Scholarship
Daniel P. Fellegara ’06 Memorial Endowed Scholarship
James E. Fassett Endowed Scholarship Fund
The Samuel B. Feitelberg Physical Therapy Fellowship Endowed Scholarship
Alan T. Finn '87 Memorial 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
George Floyd Memorial Scholarship
John F. Frazier ’38 & L.K. Sillcox Endowed Scholarship
J. Ronald Frazer ’45 Endowed Fellowship
Stig E. Friberg Undergraduate Research Endowment Award

Walter Fuss ’51 Endowed Scholarship for Civil Engineering
Phil Garda ’67 Memorial Endowed Scholarship Fund
Nelson Gibbs '59 Endowed Scholarship
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
Blayne Hartman '75 Endowed Scholarship
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
Steven Hearl ’80 Endowed Scholarship for Civil and Environmental Engineering
William Randolph Hearst Endowed Scholarship Fund
Richard Hemphill '67 Endowed Scholarship
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
Bruce ’69 and Suzanne Hoffman Endowed Scholarship
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
Albert C. and Ella W. Hyde Endowed Scholarship
Michael Lewis Jaeger Memorial Endowed Scholarship
Clarke H. Joy ’29 Memorial Endowed Scholarship
Sol Kaplan Scholarship Fund/ The Kardan Scholarship Fund
Peter A. Klein ’87 Memorial Endowed Scholarship
The Gary F. Kelly Endowed Scholarship Fund
Kent Family Endowed Scholarship
Kenyon Endowed Scholarship

Kretis Family Endowed Scholarship
Lally 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 Endowed 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
Gus’82 and Magda Mininberg Endowed Scholarship
Charles T. Mosier ’72 Memorial Endowed Scholarship Fund
Steve Neely Endowed Memorial Scholarship Fund
Nelson Endowed Scholarship
Theodore ’56 and Priscilla Nelson Endowed Honors Scholarship
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
Newkofsky Endowed Scholarship
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
James P. Papayanakos Scholarship
Kenneth R. and Margaret K. Parker Endowed Scholarship Fund
Matt and Prue Pecorella Endowed Scholarship
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
Relyea Endowed Chemistry Scholarship

Relyea Endowed Engineering Scholarship
The Ernest ’42 and Constance Richmond Memorial Endowed Scholarship Fund
Ridings Family Endowed Scholarship Fund
Robbins "I Pay it Forward" Endowed Scholarship
Elwyn J. Rodee Endowed Scholarship Fund
Paul Rodgers Memorial Endowed Scholarship
William J. Rowley Endowed Scholarship Fund
Sackett Endowed Scholarship
Willard G. '53 and Barbara B. Shafer Endowed Scholarship
Francis E. ’63 and Mona K. Sage Endowed Scholarship Fund
Sapia '58 Endowed Scholarship
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
Thomas ’70 and Gayle Sette Scholarship Endowment
Willard G. ’53 and Barbara B Shafer Endowed Scholarship Fund
Shelly Electric Endowed Scholarship Fund
Thomas E. Simpkins '30 Endowed Scholarship Fund
John and Verna Sherrick Endowed Scholarship
William ’70 and Sandra Shusda Endowed Scholarship
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
Bill ’64 and Sherrie Taylor Endowed Scholarship
Charles Thomas ’63 Adirondack Endowed Scholarship
The Thompson Family Endowed Scholarship Fund
Tilling Endowed Scholarship
Fay ’62 & Nadine Tolman Endowed Scholarship Fund
Mel Tomalty '61 Endowed Scholarship
Toole-O'Donnell Families and MVW Endowed Scholarship Fund
Earle E. Towlson ’27 Memorial Endowed Scholarship Fund
Donna and Steve Tritman '68 Endowed Scholarship
Tubbs Family Endowment
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
The Dr. John ’73 and Roberta Wasenko and Family Health Sciences Endowed Scholarship Fund
John ’52 and Jane Ward Endowed Scholarship
Weimer Endowed Scholarship
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
Stanley '57 and Viola Wetreich Endowed Scholarship
Carol Wicks '80 Endowed Scholarship
Allen '63 and Barbara Winegard Endowed Scholarship
James P. Witkowski Endowed Scholarship
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
Zieger Endowed Scholarship Fund
Zuman Award in Chemistry

Sponsored Scholarships
AAA Ehrlich Sponsored Scholarship
Kenneth R. Baker Family Engineering Sponsored Scholarship
Barrett Paving CEM Sponsored Scholarship
Bechtel Foundation Sponsored Scholarship
Boothill Stepping Stone Scholarship
Buyers 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
Elkins Sponsored Scholarship
The Brothers of Delta Tau Tau Scholarship in memory of Michael Fahrenkopf ‘11
Stig E. Friberg Award for Undergraduate Research
Sponsored Scholarship Giromini Family
Glens Falls Contractors Association Sponsored Scholarship
Kenyon Sponsored Scholarship
NewPage Corporation Sponsored Scholarship
Edwin E. Hatch Foundation Sponsored Scholarship
Honors Program Sponsored Scholarship
Hurd Sponsored Scholarship
Ralph A. Janaro Memorial Sponsored Scholarship
Lally 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
Stuart Lott '70 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
N I Rea Sponsored Scholarship
Gerald '58 and Judith Reinman Sponsored Scholarship
Ruston Paving Company CEM Sponsored Scholarship
Sage Scholars North Country 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
James P. Witkowski 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
Gordon Boncke '47 Class of 2016 Share Clarkson Direct Scholarship
Bruce G. Boncke ’71 Class of 2019 Share Clarkson Direct Scholarship
David William ’88 and Kristina Art Buchwald Share Clarkson Scholarship
Bouchard/Mountjoy Class of 2013 and 2018 Share Clarkson Direct Scholarship
Amy Castronova '04 Class of 2014 and 2019 Share Clarkson Direct Scholarship
Cecere Share Clarkson Scholarship
Bill ’73 and Carol Cotter Share Clarkson Scholarship
James M. Coughlin ’53 Share Clarkson Direct Scholarship
Richard J. Creek '66 Share Clarkson Class of 2023
Sean '89 and Lori '89 Donohoe class of 2013 and 2018 Share Clarkson Direct Scholarship
Richard Dwyer '77 Share Clarkson Scholarship 2023
William V. ’83 and Susan Fiacco Share Clarkson Scholarship
Richard Fiesinger ’67, M’68 Share Clarkson Scholarship
Goldman Class of 2013 Share Clarkson Direct Scholarship
Joel '57 and Lynda Goldschein Class of 2014 and 2018 Share Clarkson Direct Scholarship
Fred ’61 and Selma Goldstein Share Clarkson Scholarship
Jim Greenfield ’64 M’66 Share Clarkson 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
Jacobsen Family Share Clarkson Scholarship in Honor of Robert Jacobsen '66
Jolyn Foundation Class of 2013, 2014 and 2018 Share Clarkson Direct Scholarship
Gerald ’61 and Mary Kilanoski Share Clarkson Scholarship
Donald B. Kloeber '71 Class of 2023 Share Clarkson Scholarship
Matthew J. Maslyn '77 Class of 2015 Share Clarkson Direct Scholarship
Northern Lights Share Clarkson Scholarship
Francis ’85 and Christine Peverly Family Share Clarkson Scholarship
David D. Reh '62 Classes of 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 Share Clarkson Direct Scholarship
Reinman Share Clarkson Scholarship
George Schreiber '64 Share Clarkson 2023
John and Verna Sherrick Class of 2013 and 2018 Share Clarkson Direct Scholarship
Richard ’60 and Nancy Siewert, P’ 95 Share Clarkson Scholarship
Robert '74 and Julia Storms Class of 2015 and 2018 Share Clarkson Direct
Frederick W. Swanton Jr. ’68 Share Clarkson Scholarship
Scholarship Structural Associates, Inc. Class of 2013 Share Clarkson Direct Scholarship
Alissa, Donna and Steven M. '68 Tritman Class of 2017 and 2023 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
David A. Walsh '67 Class of 2023 Share Clarkson Scholarship
In Honor of Katherine H. Wears Class of 2019 Share Clarkson Direct Scholarship
Wolfley Family 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.

Prize Awards

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.

Clarkson Loan Funds

Clarkson has 23 separate loan funds from which students may borrow up to $4,000 in any semester, subject to availability and borrower qualification. These loans are available through Student Achievement 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
Water E. Turnbull Memorial Scholarship Incentive Loan Fund Arthur
O. and Louella K. West Memorial Loan Fund

Satisfactory Academic Progress for Federal and Institutional Financial Aid
The US Department of Education has issued Satisfactory Academic Progress (SAP) requirements effective July 1, 2011. These requirements are part of the Program Integrity and Final Regulations issued on October 29, 2010.

The revised Satisfactory Academic Progress (SAP) policy that follows includes the requirements of the Program Integrity Regulations and is effective at the beginning of the Fall 2011 term. Revisions to this policy were made on March 13, 2020 and are effective with the SAP evaluation that will be conducted at the end of the Spring 2020 semester and moving forward.

Federal regulations require institutions to evaluate Financial Aid SAP at the end of the fall, spring, and summer terms. Both full-time and part-time enrollment status must be evaluated as well as periods of enrollment during which the student did not receive financial aid. All students are encouraged to become familiar with the policy as eligibility for federal and institutional aid may be an important factor in being able to continue one's education at Clarkson. Students must maintain SAP to retain eligibility for federal and institutional financial aid. SAP is comprised of three areas as required by federal regulations. A student must complete their degree within a specified period, demonstrate PACE by earning a minimum percentage of attempted credit hours and maintain a cumulative GPA that is consistent with meeting graduation requirements. Some institutional scholarships (i.e. Honors, Endowed and Sponsored Scholarships) may require higher academic achievement than the standards outlined in this section. Students with questions regarding specific scholarships are advised to contact their Student Achievement Specialist.

Satisfactory Academic Progress Standards for Financial Aid are based on a student's cumulative record and are separate from Academic Standing determinations. A student who is on academic warning, academic probation, or has been approved to continue after separation retains financial aid eligibility provided the Satisfactory Academic Progress Standards for Financial Aid (detailed below) are met.

1. Maximum Time Frame for Degree Completion
    a. Federal Regulations specify that a student must complete his/ her degree within 150% of the published length of the program. The maximum time

frame at Clarkson is measured in attempted hours. A student must earn 120 credits to receive a Bachelor's degree. Therefore, to retain financial aid eligibility, the maximum time frame to complete the program for full time students cannot exceed 180 attempted credit hours, 6 years, or 12 terms, whichever comes first.

b. A part-time student cannot exceed 180 attempted credit hours. A student pursuing a second Bachelor's degree with the first Bachelor's degree must complete the additional required coursework within the 150% time frame period. Effective March 13, 2020 for the SAP evaluation period that will occur at the end of the Spring 2020 semester and going forward, a student may appeal the Maximum Time Frame requirement based on extenuating circumstances.
c. Credits counted in the maximum time are all attempted credits and include:
    i. Earned hours - Passed (A-D), Pass (P)
    ii. Repeated courses - All attempts (see repeated course section below)
    iii. Withdrawal - Maximum time frame regulations do not allow for the exclusion of courses in which a student has remained past the drop period and earned a grade of "W"
    iv. Failure - F
    v. Incomplete - I
    vi. All accepted transfer - T
    vii. All courses attempted at Clarkson, even if they are not used to meet degree requirements.

2. Pace Standards PACE is defined by federal regulations as steady progress towards degree completion within the 150% time frame. Clarkson is required to measure a student's PACE as a percentage as indicated below:
    a. A minimum percentage of attempted credit hours must be earned every semester
        i. Cumulative number of earned hours
        ii. Cumulative number of attempted hours
    b. Earned credit hours for PACE:
        i. Grades of A, B, C, D or P (with credit)
        ii. All accepted transfer credits and (including consortium agreements & Study Abroad Courses) & Test credits (T)
    c. Attempted credit hours include:
        i. Earned hours - Passed (A-D), Pass (P)
        ii. Repeated courses - All attempted (see repeated course section below)
        iii. Withdrawal - "LW" and "W". PACE regulations do not allow for the exclusion of courses in which a student has remained past the drop period and earned a grade of "W".

iv. Failure - F
v. Incomplete - I
vi. All accepted transfer - T

d. The chart below indicates the PACE required to maintain Satisfactory Academic Progress for Financial Aid. New transfer students are placed on the chart based on the number of transfer credits that have been accepted by Clarkson.

Cumulative Attempted Credit Hours	PACE – Minimum required percentage of earned credit hours divided by attempted credit hours
0-18	50%
19-36	50%
37-54	67%
55-72	67%
73-180	67%

3. Qualitative Standards – Cumulative Grade Point Average (GPA)
   a. Federal regulations require the student to meet minimum Cumulative GPA standards to retain eligibility for aid. As indicated in the following chart, after 4 semesters a student must maintain a 2.00 cumulative GPA to be eligible for financial aid.
   b. Grades earned in prior attempts of repeated courses are excluded from the GPA calculation. The chart below indicates the GPA required to maintain Satisfactory Academic Progress for Financial Aid.
   c. Transfer students are placed on the GPA chart based on the number of semesters they have attended Clarkson

End of semester	Minimum GPA required at the end of semester
First	1.00
Second	1.40
Third	1.75
Fourth-Twelfth	2.00

Warning Term

A student who does not meet both the PACE and GPA standards is not making Satisfactory Academic Progress for Financial Aid. The student is notified by the Financial Aid Office that he/she is on Financial Aid Warning for the subsequent term of

attendance. During the Financial Aid Warning Term, the student retains eligibility for both federal and institutional aid.

A student who meets both the PACE and GPA standards at the conclusion of the Financial Aid Warning Term is again meeting Satisfactory Academic Progress for Financial Aid and is eligible for federal and institutional aid for the subsequent term of attendance.

A student who does not meet both the PACE and GPA standards at the conclusion of the Financial Aid Warning Term is notified by the Financial Aid Office that he/she is not making Satisfactory Academic Progress for Financial Aid and is ineligible for federal and institutional aid. The student is also notified of the Appeal Process. A student may have more than one Financial Aid Warning Term; however they may not be consecutive.

Appeal Process
A student may file an appeal based on catastrophic or extraordinary circumstances "beyond the student's control," such as personal illness or injury, or the death, illness or injury of a family member, relative or close personal friend. A student is allowed to appeal once based on a change of major.

Students who have been disqualified from aid are notified at the end of the term or when readmitted regarding how to begin the appeal process. It is recommended that students submit the appeal within 3 weeks of notification of their disqualified status.

There are 3 required elements of an appeal:

1. A written statement from the student – Federal regulations require a student who is requesting an appeal to submit a written statement explaining: Why the student was not able to meet the satisfactory academic progress standards. What has changed that will allow the student to meet the standards at the conclusion of the academic plan (See #3 below)
2. Supporting documentation – A student requesting an appeal must submit supporting documentation such as physician's written statement to substantiate illness from clergy, family member(s), or other third party familiar with the student's situation, or a written statement from an academic advisor, professor, or counselor
3. Development of an Academic Plan – As part of the appeal, the student must work with a Program Administrator to develop an academic plan. The academic plan is designed to enable the student to meet both PACE and GPA standards at the conclusion of the plan. An academic plan may entail one or more terms and includes specific requirements the student must achieve. Although the student is not making satisfactory academic progress, federal and institutional aid is reinstated on a term by term basis.

A student filing an appeal must authorize the release of pertinent information as part of an investigation of the facts concerning the failure to meet satisfactory academic progress standards.

Each appeal will be investigated and reviewed by the Dean of Students in conjunction with faculty members from the student's program of study as well as other Clarkson University personnel as necessary.

The Dean of Students will make a recommendation to approve or deny the appeal and notify the Office of Financial Aid. The Director of Financial Aid will make the final decision to approve or deny the appeal.

The Office of Financial Aid will notify the student by letter or e-mail of the final decision. Upon approval of an appeal including an academic plan the student is placed on Financial Aid Probation for the next term of attendance.

At the end of the Financial Aid Probationary term, the student will be evaluated according to the requirements specified in the academic plan. Provided that the student is successfully meeting the conditions of the plan, the student may continue to receive federal and institutional aid for the subsequent term. In cases in which an academic plan includes more than one term, the student will be evaluated at the end of each term. If the student continues to meet the requirements of the plan, the student remains eligible for financial aid.

A student who does not meet the conditions of the academic plan or whose appeal is denied is no longer eligible for federal and institutional aid at Clarkson until both standards are met. A student who is ineligible for aid may regain eligibility by:

1. Taking courses at Clarkson without receiving federal or institutional aid that raises their GPA to the minimum standards and/ or increases earned hours to the minimum PACE requirements. The students must contact their SAS representative at the end of the term to request an evaluation of their financial aid, satisfactory academic progress standing and financial aid eligibility.
2. Transferring in course credit – A transferred course must count toward degree requirements. A minimum of a "C" is required for transfer credits. Transfer credits are included in both attempted and earned hours. Transfer credits for repeated courses may have an effect on the GPA. Transfer credits for non-repeated courses have no effect on the GPA.

Subsequent Appeals - effective March 13, 2020

A student who does not meet the requirements of their academic plan, is permitted to submit a subsequent appeal. The appeal must be based on new extenuating circumstances that have occurred during the current semester and are outside of the student's control.

Repeated Courses
Courses in which a grade of F or W is recorded on a student's transcript may be repeated a maximum of 2 times. The earned hours are counted once. The attempted hours are counted each time and may be used to establish full time enrollment status.

The student may receive financial aid for these course repeats. Courses in which a student has previously earned credit (A, B, C, or D) Federal regulations allow a student to repeat a course once if the student previously earned credit for the course. The repeated course(s) will be used toward full time enrollment status and are eligible for financial aid. Courses repeated more than once will not count toward enrollment status and are ineligible for financial aid. More than one course may be repeated per term. This does not apply to students receiving International Scholarships.

The attempted hours are counted each time. The earned hours are counted once. The grade from the prior completion(s) is excluded from the GPA calculation.

Academic Grade Changes and Incompletes
For purposes of determining SAP for federal and institutional financial aid, all grade changers including incompletes must be submitted to SAS prior to the 10th day of the subsequent term. This deadline may differ from academic departmental guidelines. The student must contact their SAS Specialist to request a recalculation of SAP.

Readmitted Students
A student who has left the University for one or more terms and has been readmitted will have Satisfactory Academic Progress for Financial Aid reviewed at the time of readmission. Transfer credits must be received prior to the 10th day of the term in order to be included in the SAP determination.

If the student is determined to be meeting SAP, federal and institutional aid will be offered provided the student meets all other eligibility requirements.

If it is determined that the student is not meeting SAP, the student will be notified by letter of his/ her status and the appeal process. There is no guarantee that a readmitted student will receive the same type or amount of institutional aid they received during prior terms.

Total Withdrawal from the University & Federal Title IV 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 Achievement Services to begin the official withdrawal process.

The law specifies how Clarkson must determine the amount of Title IV program assistance a student has earned as of the date of the withdrawal. 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 a student withdraws from the university during the term, the amount of Title IV program assistance that the student has earned up to that point in time is determined by a specific formula. If the student received less assistance than the amount that earned, the student may be able to receive those additional funds. If the student received more assistance than earned, the excess funds must be returned to the US Department of Education.

The amount of assistance that the student has 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 term. For example, if the student completed 30% of the term, the student earns 30% of the assistance originally awarded. Once the student has completed more than 60% of the term, the student has earned all of the assistance awarded for the term. Federal regulations require this calculation if the student officially or unofficially withdraws, is dismissed or otherwise leaves the University during a term.

Student transcripts are reviewed at the conclusion of each term. If a student received all "F" grades during a term, 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 term 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 term, no adjustment to a student's financial aid for that term 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 term 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 term.

The Federal Title IV Refund Procedure is separate and distinct from the University'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 may be reduced based on individual circumstances, the date of withdrawal and the University's Refund Policy. Satisfactory Academic Progress for students who return to the University for a subsequent term will be reviewed and a determination will be made based on the Maximum Time Frame, PACE and GPA standards as stated above.

Student Accounts

Travis Dox, Bursar
Kevin Cook, Assistant Bursar

Expenses

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

University Charges

The summary of annual fixed University charges for the 2025-2026 academic year follows:

Fixed Charges 2025-2026	
$59,800	Undergraduate full-time charge (12 to 19 credit hours)
$1,993	Undergraduate credit hour rate (11 hours or less)
$10,523	Room (based on weighted average)
$8,279	Meal Plans
$1,348	Undergraduate student fees
$1,898	Clarkson School student fees
$79,910	Undergraduate full time direct costs

Undergraduate students registered for 12 to 19 credit hours (inclusive) are designated as full-time students and are charged at the full-time rate. Students exceeding the full-time load of 19 credits will be charged at the credit hour rate for each credit hour in excess of 19 in addition to the full-time tuition rate charge. Other expenses, such as travel, books, and spending money, vary. An estimated figure is approximately $4,124 for one academic year.

Clarkson University Student Association (CUSA) Activity Fee

Assessed by CUSA on all undergraduate students carrying a minimum of 6 credit hours per semester and distributed to clubs and organizations.

Clarkson University Student Association (CUSA) Campus Improvements Fund Fee
Assessed by CUSA on all undergraduate students carrying a minimum of 6 credit hours per semester for capital projects as identified by students.

Resources Fee
Assessed to all full-time students. Covers operations for recreational facilities, fitness facilities, health facilities & services, counseling facilities & services, computing facilities, services & related software, webinars, etc.

The Clarkson School Event Fee
Assessed to The Clarkson School students to assist in covering various student activities such as field trips. In addition, a portion of the fee provides for any guest lectures and special meals sponsored by The Clarkson School.

Health Insurance
Health insurance is mandatory at Clarkson University for non-distance program students. All students must either have health insurance coverage under their own policy or be covered by their parent's policy or enroll in Clarkson's contracted insurance. The current rate is $2,536 for coverage from 8/1/2025 – 7/31/2026. To assure clearance for check-in, students need to complete an activity guide in their myCU account and secure an approved waiver if need be on a yearly basis.

Payment
Payment in full for all tuition, fees, residence and dining expenses must be made on or before the financial clearance deadline. 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 monthly. Enrollment indicates that the student agrees to pay all attorney's 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 diplomas until the balance of the account is paid in full.

Tuition and Fees Refund Policy
All refunds will be based on the last recorded day of attendance as determined by and attested to by the Student Achievement Services Office. A student who withdraws within the first 20 class days of the term is eligible to receive a proration of charges using the following calculation:

Semester (Fall & Spring) Program Refund Policy	
Prior to the start of the term	100%
1st week of the term	90%
2nd week of the term	75%

3rd week of the term	50%
4th week of the term	25%
5th week of the term until the end of the term	0%

The corresponding calculations above will be applied to tuition, CUSA Activity Fee, CUSA Campus Improvements Fund Fee, Resources Fee, The Clarkson Bound Book Program, The Clarkson School Event Fee, Room and Meals (consumption is not taken into consideration).

There will be no refund of the Student Health Insurance Premium if the coverage is in force.

This refund policy has been established in conformance with the Higher Education Act of 1992, as amended in April & November of 1994 and by GEN-95-22 (Dear Colleague Letter) of April of 1995.

An exception to the Refund Policy has been made for students that are enlisted and active (prior to the start of the term) in the military that are forced to withdraw during a term due to a military deployment or a change of assignment. Official documentation of the deployment or change or assignment may be requested by Clarkson University from the student for the exception to the Refund Policy to take effect. The following adjustments to the student's account can be expected if the student meets the aforementioned criteria:

- 100% refund of tuition, fees and room cost
- This exception to the Refund Policy does not apply to Board or Student Health Insurance

Arts, Culture & Technology Department
Jerry W. Gravander, Co-Chair
Lisa Propst, Co-Chair

The Department of Arts, Culture & Technology offers an interdisciplinary curriculum. Integrating knowledge from several disciplinary areas to address recently emerging issues, all offerings benefit from Clarkson's strengths in engineering and business, and all are focused on preparing students for graduate school, professional programs, and careers.

Clarkson University is no longer accepting applications for the Bachelor of Science Degrees in Communication, Digital Arts & Sciences, History, Interdisciplinary Liberal Studies, Interdisciplinary Social Sciences, Literature, Political Science, and Sociology. Continuing students may reference historical University Catalogs for each of these program's degree requirements.

Minors in Arts, Culture, and Technology
The Arts, Culture, and Technology (ACT) Department helps students to stand out by building essential "power" skills alongside your major. With minors across the arts, humanities, communications, and social sciences, you'll sharpen your creativity, critical thinking and problem-solving — making you a well-rounded, career-ready pro in any field.

Clarkson University is no longer accepting applications for the Bachelor of Science Degrees in Communication, Digital Arts & Sciences, History, Interdisciplinary Liberal Studies, Interdisciplinary Social Sciences, Literature, Political Science, and Sociology. Continuing students may reference historical University Catalogs for each of these program's degree requirements.

Disciplinary Minors

1. Communication (see requirements below).
2. Digital Arts (see requirements below).

The disciplinary minors below each consist of any five courses in one of the disciplinary areas in the Department of Arts, Culture, and Technology:

3. Anthropology
4. History
5. Sociology
6. Philosophy
7. Political Science
8. Interdisciplinary Social Sciences.

Interdisciplinary Thematic Minors

1. Gender and Sexuality Studies (see requirements below).
2. Military Science (see requirements below).
3. Law Studies (please see the Law Studies Minor content located in the David D. Reh School Business section of the Catalog).

The interdisciplinary minors below consist of five related courses that address a common theme:

4. International and Cross-Cultural Perspectives
5. Literature and the Arts
6. Science, Technology and Society
7. War Studies
8. Social Justice and Equity Studies

Student Designed Minors
Students propose these minors through the office of the Department of Arts, Culture & Technology. The proposal lists the courses that a student will take for their 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 Arts, Culture & Technology. Guidelines for developing and submitting a proposal for a student-designed minor are available from the department office.

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 2.00 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. The currently available courses in each group are listed below. Contact the Arts, Culture & Technology departmental office for further information.

Choose one Writing course from the following:	
COMM 210	Theory of Rhetoric for Business, Science and Engineering
COMM 219	Introduction to Social Media
COMM 226	Short Film Screenwriting
COMM 245	Writing for Media
COMM 312*	Public Relations
COMM 313*	Professional Communication
COMM 314*	Communicating, Promoting and Marketing “Place”
COMM 315*	STEAM Journalism
COMM 326	Feature Film Screenwriting
COMM 330	Science Journalism
COMM 428*	Environmental Communication
Choose one Speaking course from the following:	
COMM 217	Introduction to Public Speaking

COMM 312*	Public Relations
COMM 313*	Professional Communication
Choose one Design course from the following:	
COMM 100	2D Digital Design
COMM 229	Principles of User-Experience Design
COMM 322	Typography and Design
COMM 327	Digital Video Production
COMM 329	Front-End Development for the Web
COMM 345	Information Design
COMM 360	Sound Design
COMM 427	Digital Video Production
Choose one Theory course from the following:	
COMM 310	Mass Media and Society
COMM 314*	Communicating, Promoting and Marketing “Place”
COMM 315*	STEAM Journalism
COMM 410	Theory and Philosophy of Communication
COMM 412	Organizational Communications and Public Relations Theory
COMM 428*	Environmental Communication

*Courses 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 Arts, Culture & Technology Department must approve transfer courses.

Minor in Digital Art
In addition to the minor portfolio requirement DA 499, all students choosing a minor in Digital Art must complete 15 credit hours within the listed class selection and satisfy the following requirements:

Completion of DA 100: Introduction to Digital Art: Time and Image or its cross-listed counterpart COMM 100: 2D Digital Design.

• Two classes from the following list at 100-level or higher.
• One class from the following list at 200-level or higher.
• One class from the following list at 300-level or higher.

DA 110	Drawing
DA 120	Elements of Design
DA 140	Introduction to Digital Art: Form & Code
DA 207	Media Landscapes 1
DA 208	Media Landscapes 2
DA 212	Art in Context
DA 225	Digital Painting & Illustration
DA 250	Interactive & Algorithmic Art
DA 300	3D Imagery & Animation
DA 320	Moving Images: Motion Graphics & Animation
DA 340	Virtual Reality (VR) and Mixed Reality
DA 39*	Special Topics Classes in Digital Arts & Sciences
DA 400	Directed & Collaborative Study
DA 410	Directed & Collaborative Study
DA 42*	Digital Arts Independent Studies
DA 500	Directed Study & Collaborative Projects

(As the capstone class in the Digital Arts & Sciences major, DA 492 Senior Studies is not open to students taking the Digital Art minor.)

Completion of a Digital Arts Portfolio
Under the guidance of Digital Arts faculty advisers from within the Department of Arts, Culture & Technology students will compile a portfolio that functions as a way of showcasing and reflecting upon their achievements within the minor. The portfolio will be completed within a zero-credit hour course (DA499 Digital Art Minor Portfolio.) Students must receive a P (pass) in the minor portfolio in order to complete the requirements for the minor.

Minor in Gender and Sexuality Studies
All students choosing a minor in Gender and Sexuality Studies must complete 15 credit hours and satisfy the following requirements:

Required courses:	
Either SS 220 or SS 221	Introduction to Gender Introduction to Sexuality
Choose four of the following Gender and Sexuality courses	
SS 220 or SS 221	Introduction to Gender Introduction to Sexuality (Whichever one was not taken to satisfy the required course)
ANTH 225	Global Perspectives on Sexuality
ANTH 325	Sex and Commerce
ANTH 330	Men and 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

Advising for the minor takes place in the Department of Arts, Culture & Technology.

Minor in Military Leadership Studies

The minor in Military Leadership Studies offers students the opportunity to capture the academic rigor and commitment they have made to study one of our country's major instruments of power, the United States military. In addition to studying Air Force or Army organizations, missions, and operations, the student will gain a broad perspective of the military in general by studying the history of all Department of Defense Services and completing a leadership and/or history course emphasizing the key elements of leadership required of a military officer. Completion of the core required courses will provide students with instruction and application of leadership principles. Knowledge gained on basic skills that can be applied to any profession include values, ethics, time and stress management, risk assessment, decision making, team building, team dynamics, motivating people, counseling techniques and briefing techniques. Additional military oriented competencies taught that can be used as life skills include land navigation, survival training, basic medical training, fitness principles, terrorism awareness, cultural awareness, supply management, maintenance management.

The program is overseen by faculty members from the Departments of Air, Space and Cyberspace Studies (AS) or Military Science (MS) depending on chosen track. These faculty members will annually review the list of course electives for the minor and make appropriate changes (additions and removals) as needed.

Student Learning Outcomes of the Minor

1. Acquire a broad perspective on the military and branches of service: Air Force, Space Force and Army.
2. Demonstrate and apply an understanding of individual and group dynamics and formal and informal leadership.
3. Demonstrate and apply an understanding of governmental applications of power.
4. Demonstrate preparation for commissioning (AS and MS tracks only).

Requirements

<u>Air, Space and Cyberspace Studies Track: (19 credits)</u>

AS101 Heritage and Values
AS201 Heritage and Values
AS201 Team and Leadership Fundamentals
AS202 Team and Leadership Fundamentals
AS301 Leading People and Effective Communication
AS302 Leading People and Effective Communication
AS401 National Security Leadership Responsibilities & Commissioning Preparation
AS402 National Security Leadership Responsibilities & Commissioning Preparation
AS103 Mil Leadership Lab
AS104 Mil Leadership Lab
AS203 Mil Leadership Lab

AS204 Mil Leadership Lab
AS303 Mil Leadership Lab
AS304 Mil Leadership Lab
AS403 Mil Leadership Lab
AS404 Mil Leadership Lab
One Related Elective Course (3 Hours) from the approved related course listing

Military Science Track (19 Credits)

MS111 Foundations of Officership and Basic Leadership
MS112 Foundations of Officership and Basic Leadership
MS221 Individual Leadership Studies
MS222 Individual Leadership Studies
MS331 Military Leadership & Problem Solving
MS332 Military Leadership & Problem Solving
MS441 Military Leadership and Management
MS442 Military Leadership and Management
MS100 Mil Leadership Labs
MS200 Mil Leadership Labs
MS300 Mil Leadership Labs
MS400 Mil Leadership Labs
One Related Elective Course (3 Hours) from the department's approved related course listing

Non-commissioning Student Track (19 Credits)

All 100 and 200 series MS track courses and five courses (15 credits) from the department's approved related course listing OR

All AS track courses other than AS402 and two courses (6 credits) from the department's approved related course listing.

Note: Non-commissioning track students cannot participate in Leadership Labs or Physical Training.

Related Elective Course Listing (Contact either the AS or MS department for the most recent list.)

PHIL200 Philosophy and Contemporary Issues
HIST270 Introduction to Culture, Society & Biology
HIST235 Flight in History
HIST240 War and Society
HIST241/LIT241 War Stories I
HIST340 War in Ancient Greece
HIST341 War in Ancient Rome
HIST343 War in the Middle Ages
HIST347 World War I

HIST348 World War II
HIST349 Cold War Era: War and Society in the…
HIST365 Technology and the Modern State
PY461 Judgment and Decision Making
OS286/ PY286 Organizational Behavior I
PHIL330 Logic for Critical Thinking
POL220 American Politics
POL240 Politics, Decisions and War

Independent Research Plan (pending approval of Owning Dept and respective MS/AS Dept Chair)

Other related elective course options must be proposed by the student to either Chair before related elective credit will be awarded. The above related elective course listing is an adaptive listing and will be updated to reflect changes to the university course catalog.

Honors Program
Kate Krueger, Director

Clarkson offers a separate four-year undergraduate Honors curriculum for motivated, curious students majoring in any of our degree programs. Honors students are engaged learners who collaborate and work with each other, our campus, and our community to research solutions and solve problems. Clarkson Honors fosters the potential of students and faculty who, together, create a transformative educational experience. From this foundation, Honors students pursue deep learning in research and in hands-on experiences, culminating in a capstone they design. This community-based model means Honors students lean on and learn from each other, take the same Honors courses together, live together, socialize together, and support each other throughout their time at Clarkson. Honors students must maintain a grade-point average of 3.25 and keep up with the program's service requirement to remain in good standing.

Applicants to the Honors Program must complete an online application, which includes two short essay questions, a résumé, and a "show and tell" question about their passions. The Honors Program admits up to 60 new first year students and up 10 sophomore or junior students per year

Clarkson Honors complements curriculum in all majors, emphasizing the development of critical thinking, problem solving, teamwork, and communication skills. Students take one Honors course per semester. Courses develop as interlocking, multidisciplinary sequences, bringing perspectives from different academic disciplines to bear on contemporary problems at the interface of science, technology and society. The Honors approach is open-ended and project-based.

The Honors curriculum is a unique four-year sequence of courses specifically designed for Honors students in which students develop skills in teamwork, problem-solving, ethical decision-making, and oral and written communication. The Honors track replaces the Clarkson Knowledge Areas and offers different (but not additional) coursework to complement Honors students' major coursework. Clarkson Honors courses capitalize on the strengths of the Honors community: we emphasize diverse academic disciplines and social perspectives, so the courses complement any major and strengthen your own skills. The climax of this sequence is the Honors capstone, which allows students to define and explore an original topic of their choosing.

Clarkson Honors also offers students opportunities to engage in original research through its summer research programs where students participate in cutting-edge research with faculty mentors for up to ten weeks. The Honors five-week "pre-frosh" summer research program also provides a unique opportunity for incoming first year students before they matriculate at Clarkson.

All students must complete an Honors capstone of their own design which is generally imagined and completed in their junior and senior year under the guidance of their Honors advisor and a faculty member. A wide range of topics and formats is accepted, from laboratory research to business plans, from engineering design to creative artwork, and from software applications to co-op assignments and internships.

Honors students enjoy many other benefits, including:
1. The Honors Scholarship as part of their Clarkson financial assistance package;
2. The Honors Educational Enhancement Scholarship that funds high impact scholarly and professional development activities;
3. A residential living-learning community; and
4. Holistic Honors advising

The Honors Program at Clarkson is supported by an Honors Council composed of representative faculty and staff, and Honors students who are elected by their peers to serve on the Honors Student Steering Board.

The Clarkson School
Brenda Kozsan, Director
Sarah Treptow, Associate Director

The Clarkson School is a unique program for talented high school age students who are ready to begin college early. Unlike many early-entrance college programs, The Clarkson School provides a full-time residential program and dedicated advising that facilitates the transition to college life. The Clarkson School has been bringing academically advanced students to Clarkson University since the fall of 1978.

Students who enroll in The Clarkson School live together on campus in a community with specially trained residential advisors. Commuting day students from St. Lawrence County may also join the community. Our students are matriculated as first year University students and typically earn about 32 - 34 college credit hours during the year. Courses are selected from the University's offerings across the curriculum. With assistance from the school staff, students design their programs of study to meet their individual interests and needs.

The low student-staff ratio of The Clarkson School ensures individualized attention. Our advising programs emphasize time-management and study skills that are essential for success in college. We assist in career and major exploration and each student's progress toward their goals is carefully monitored. Individualized assistance is provided where necessary. Through our PE100 - First Year Seminar class, students build on their personal and professional skills through in-class exercises, guest speakers and workshops focusing on resume and cover letter writing, preparation for career fairs and job interviews, communication skills, networking and other topics. We believe that our students will grow personally and professionally to become fully contributing members of our community and of their communities in the future.

Family dinners are held to build a sense of community amongst The Clarkson School students, themed to address the needs of first year students. For example, students enjoy guest speakers, meeting faculty mentors and alumni of The Clarkson School, an "etiquette dinner" as well a dinner at the President of the University's home. Field trips are also an integral part of the program, and they typically combine educational and community-building activities. The Clarkson School students may also participate in University organizations and clubs, including intercollegiate and intramural sports.

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

The cost of The Clarkson School is comparable to the cost of a year at Clarkson University. Merit and need-based financial aid is available to all accepted students. Please note that students who elect to remain concurrently enrolled in high school while attending The Clarkson School are not eligible for federal financial aid. Students have the option to either graduate in January or June from their former high school. 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 demonstrate personal maturity, high levels of achievement in their academic work, 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. Attention is also given to letters of recommendation as further evidence the student is prepared for the early college experience.

A completed application portfolio includes The 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, along with a $500 Enrollment Deposit for accepted students who wish to reserve a spot in the class.

All applicants are strongly encouraged to visit 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 earlier application is highly 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, contact tcs@clarkson.edu

Clarkson Ignite
Ashley Sweeney, Director

Clarkson Ignite serves the entire campus as an innovation ecosystem that connects students, faculty, staff, alumni, and community leaders to gain critical hands-on creative experience. How? Through shared spaces and programming aimed at stimulating intellectual curiosity, developing entrepreneurial mindsets and skillsets, expanding firsthand learning and making experiences, and forging social and professional connections.

Clarkson Ignite works to instill new ways of thinking and doing in all Clarkson students. The Ignite ecosystem encompasses five key elements: curriculum, extracurricular activities, research, making, and business incubation through the Shipley Center for Innovation. The ecosystem includes the Innovation Hub located in the Andrew S. Schuler Education Resources Center home of group collaboration space, the Makerspace, the Digital Making Suite, and the Studio which is located in Bertrand H. Snell Hall.

Additional co-curricular opportunities may be found in additional Academic Affairs sections of the catalog

The Shipley Center for Innovation
Jamey Hoose, Director

The Shipley Center for Innovation, which is organized within the Office of Sponsored Research Services, is a University-wide resource dedicated to bringing Clarkson innovations to market via technology transfer, gaining recognition for the technology created by our faculty and students, and creating local jobs for graduating Clarkson students. The Center, which acts as the "business incubation" component of Clarkson Ignite, serves as an engine for economic development in the North Country by engaging in the creation of new enterprises that capitalize on emerging technologies.

In addition to providing general mentorship and services to Clarkson startups, the Shipley Center manages a thriving business incubator location on Clarkson's downtown campus. In 2018 the Shipley Center launched a new student accelerator program, The Cube, which provides dedicated student entrepreneurs with additional resources to help grow their idea into a profitable company. Shipley Center staff also conduct workshops and hold office hours to provide instruction in basic early-stage concepts such as business modeling and customer discovery.

Advising Services
University Advising is an important resource embedded in each of the Schools. Professional and faculty advisors provide key infrastructural support to ensure advising consistency, equitable access, quality assurance, and continual assessment to meet strategic metrics in support of student achievement and persistence to graduation.

Pre-Health Professions Advising
Damien Samways, Associate Professor and Chair of the Pre-Health Advising Committee

Students receive advising to prepare them for acceptance into professional school for the health sciences through any major at Clarkson. For a more structured path into these professions, students can choose to complement their primary degree with a minor in Medicine and Health Care, which includes courses covering the interdisciplinary range of knowledge and perspectives necessary to be an effective health-practitioner. Regardless of the undergraduate path taken, Clarkson'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.

<u>Pre-Occupational Therapy and Occupational Therapy</u>
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 315-268-4412.

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 in 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 in Physician Assistant Studies. Students interested in preparing for entrance into Clarkson's Master of Physician Assistant Studies degree program should contact the department at 315-268-7942.

Pre-Health Tracks

Students intending to apply to professional school for any of the health sciences (including, but not limited to, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Science, Pre-Optometry, Pre-Pharmacy, Pre-Chiropractic) will receive guidance in the planning and completion of required coursework and professional experience, in addition to assistance in submitting their final application. Clarkson provides committee letters to accompany applications when requested and also offers a preparatory course for students required to sit the MCAT.

Students may contact healthadvising@clarkson.edu for further details.

Pre-Law Advising

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 is 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.

University Studies Advising
Jerry Gravander, Interim Advisor

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. Students registered under University Studies are full-time matriculated undergraduate students who have yet to declare a specific major area of study. In all cases, a selection of an academic major will occur prior to the end of the freshman year.

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 advisors 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 activities that help to 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.

Individually Designed Bachelor of Professional Studies Program - BPS
In addition to the Bachelor of Science (BS) degree, Clarkson offers a Bachelor of Professional Studies degree, individualized major, providing 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. The BPS is offered both full-time or part-time and may be completed in residence, distance format, or a combination of both.

Non-Degree Students
An individual may enroll at Clarkson University for non-degree study on either a full-time or a part-time basis. Although such individuals are classified as non-matriculating, 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.

Undergraduate students who are enrolled as non-degree students may not earn a degree from the University without gaining admission to an undergraduate degree-granting program. Non-degree 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 non- degree student should contact Student Administrative Services. Non-degree students must obtain approval for courses they want to enroll in from the School of Arts and Sciences Professional Student Advisor. This approval is given on the basis of the student's academic preparation/background and personal goals. Students have no class standing and are not eligible to participate in any extracurricular activities involving intercollegiate competition.

Paramedic Program: Non-Degree Clock-Hour Program Certificate
Douglas Wildermuth, Director of EMS

Credential Awarded
Upon successfully completing this course, the student will be eligible to take the New York State Paramedic exam and the National Registry exam.

Program Description
The paramedic certificate program will provide students with the advanced knowledge and skills necessary to care for the sick and injured in the prehospital setting as a paramedic. This course does prepare entry-level paramedics in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains to enter the profession. Through performance of assessments and providing medical care, paramedics are able to recognize and treat a variety of ailments and trauma to the human body from the beginning of the healthcare continuum (outside the hospital). Their goal is to reduce the mortality and morbidity due to illness and injury. Paramedics are responsible and accountable to their patients, the emergency services field, and their peers.After successfully completing this course, the student will be eligible to take the New York State Paramedic exam and the National Registry exam. Once certified, students will be field trained ready to utilize their skills in multiple positions within the healthcare field or help prepare students for future healthcare studies and careers.

Admission Requirements

- Submission of an application and one letter of reference

- At least 18 years of age
- High school diploma, GED, or an unofficial college transcript*
- Ability to read, write, and speak English*
- Be able to meet the minimum requirements for the cognitive and psychomotor components of the examination with reasonable and appropriate accommodations for those persons with documented disabilities, as required by the Americans with Disabilities Act (ADA)*
- Active New York EMT, AEMT or NYS Critical Care Technician certification upon enrollment*
- Copy of a current driver license or government-issued ID
- Submit clinical health requirements to Clarkson University Student Health no later than 30 days prior to the start of class.
- Computer access (with audio and video), with internet access, camera and microphone (capable of working with remote meetings, i.e. Zoom), email, and printer for homework

*All students will need to establish a FEMA student identification to participate in required online learning activities. The FEMA student ID can be obtained by going to https://cdp.dhs.gov/femasid.

Tuition and Fees

- Tuition is $10,600.00
- NREMT Written Exams (Post-course) $152.00
- NREMT Psychomotor Exam (if taken off-site) $250-$350

Program Length and Class Schedule

A 9-month program divided up into two parts. The first 4 ½ months is classroom every Monday, Tuesday, Thursday and Friday from 8:30 am till 4:30 pm. The second half of the program requires good coordination from the student but they should dedicate about 36-40 hours per week to plan for clinical and field time.

Refund Policy

Students who voluntarily withdraw from the program or who are unable to meet the academic requirements of the program and are asked to withdraw are eligible for a refund of tuition according to the following schedule:

- Within the first week of class: 80%
- Within the second week of class: 50%
- Within the third week of class: 30%
- Within the fourth week of class: 10%
- After the fourth week of class: 0%

Enrollment Process
Applicants must submit an application and meet the required deadlines to be eligible for a spot in the class. Deadlines can be found on the website: Paramedic Program | Clarkson University

Licensing or Regulatory Body
New York State Department of Health Bureau of Emergency Medical Services.

Location of Instruction
Clarkson University
Clarkson Hall, Room 3009
59 Main Street
Potsdam, NY 13699

Didactic Portion
Fourth week of August till 3rd week of December is class from 8:30 am till 4:30 pm on Monday, Tuesday, Thursday and Friday.

Required Courses
Introduction to Paramedicine - 119 hours
Paramedic Assessments - 77 hours
Paramedicine II - 63 hours with 35 hours of lab
Specialty Populations in Paramedicine - 77 hours
Advanced Trauma & Scene Operations - 119 hours

Clinical/Field Portion
First week of January till 3rd week of May. Good coordination and planning through the clinical coordinator and the student will place the student in a variety of venues to accomplish their skills, see patients and then later work under the guidance of a field training officer/preceptor in their field. These courses include:

Phase II Clinicals - 284 hours
Phase III Field & Capstone - 320 hours

Multidisciplinary Project and Multidisciplinary Team 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.

Summer Sessions
Clarkson offers summer sessions for undergraduates. A well-balanced offering of courses enables students to:

1. Participate in programs such as Cooperative Education of study abroad and still graduate with their class;
2. Enrich their academic program with electives that do not fit into the normal semester; or
3. 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 ten 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.

Major Fellowships and Awards

Clarkson's Coordination Service for Major Fellowships, Scholarships & Awards promotes the full potential of award candidates through a deep learning experience, developing scholars by way of one-on-one advising throughout the application process to facilitate rigorous intellectual and personal growth. Advising guides undergraduates, graduate students, and alumni through the major award application process and serves to leverage their high-quality research and scholarship education into transformative and life-long success within their careers and as citizens of their communities. This service provides outreach to all students and campus partners on available awards, such as Fulbright, Udal, Goldwater, and works in concert with Clarkson's globally-oriented faculty and staff to identify qualified students and awards suited to their future goals while facilitating national scholarship competitions and nomination processes on Clarkson's campus. This service adheres to the values of integrity, collaboration, respect, and fairness of professional fellowship advising as identified by The National Association of Fellowship Advisors (NAFA) Code of Ethics and views the major scholarship and fellowship advising experience as an integral part of the Clarkson transformative educational approach to engage the Clarkson community in promoting, participating in, and celebrating the excellence of our high-achieving students.

Sponsored Research Services

Sponsored Research Services (SRS) 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. SRS 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, SRS

promotes innovation and creativity, thereby increasing knowledge and making the knowledge available and useful for scholarship and education.

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, including the cross-registered course, eligible students can take up to two courses (not available in their home institution) per academic year totaling no more than eight 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.

A form for cross-registration is available at
https://associatedcolleges.org/services/cross-registration/

Students will be enrolled as non-matriculated students at the host institution and the course(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 to receive transfer credit at Clarkson. Grades in such courses are not used in computing a student's GPA, and are not counted toward the minimum number of credits required for academic honors. If cross-registration credits results in a course load requiring additional tuition charges, the student is responsible for those additional charges.

University Libraries
Alexander Cohen, Director of Libraries

The University Libraries provide comprehensive knowledge resources and services to support research, scholarship, teaching, and learning. We are dedicated to offering collaborative support for exploration, discovery, and life-long learning skills to all Clarkson University faculty, staff, students, and to citizens of our local community no matter their location and with respect to diverse needs.

The Harriet Call Burnap Memorial Library is the main library located on the Potsdam Collins Hill Campus in the Educational Resources Center (ERC). Its collections offer materials in various formats including journals, books, audio visual materials, government documents and reports, Clarkson University dissertations, and archival materials. The Health Science Library (HSL) is the University Libraries' extension library and is located in The Earl R. and Barbara D. Lewis School of Health Sciences (Clarkson Hall) on the downtown Potsdam campus. It provides a wide range of information resources focused on medicine and healthcare. Both locations offer a comfortable place for study.

Physical Education

Laurel Kane, Director of Athletics & Recreation

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, Gold, 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 on the Potsdam campus, adjacent to the residence halls and easily accessible to all students. Facilities include the Denaka 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.

The Department of Athletics and Recreation offers a number of summer camp opportunities. For more details, contact 315-268-6622 or visit the website.

ENROLLMENT AND STUDENT ADVANCEMENT

Brian Grant, Vice President for Enrollment and Student Advancement
Matthew Rutherford, Assistant Vice President of Admissions

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 early 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. Clarkson University has adopted a test optional policy. Students may submit self-reported scores if they choose for the purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
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 an English proficiency test. For further information on these exams, please see page 83.
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 or email admissions@clarkson.edu. 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 sciences 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:

Engineering, Science, and Engineering & Management Programs	Business and Liberal Arts
• English (4 units) • Mathematics (4 units) • Science, including (3-4 units): Chemistry (1 unit) Physics (1 unit)	• English (4 units) • Mathematics (3 units) • Sciences (1 unit)

High school mathematics preparation should emphasize the thorough mastery of fundamental definition, 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 Application or the Common Application. The applications are available at Applying for Undergraduate Programs.

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 if students choose to submit for consideration, 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, SAT or ACT test results if students choose to submit for consideration, and recommendations should be received no later than December 15.

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 email or phone at least one week prior to the intended visit. A personal interview conducted by a local alumnus 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 or via email at admissions@clarkson.edu.

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 $500 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 1st. The deposit is credited to the first year University charges. It is nonrefundable if the student decides not to attend Clarkson.

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 Articulation Agreements. 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 consistently 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:

1. Submit a completed Transfer Common Application or Clarkson University Transfer Application at https://www.clarkson.edu/apply-now
2. 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.
3. Submit the Dean of Students Recommendation or Common Application College Report. This can be completed by Dean or equivalent title.
4. Clarkson University has adopted a test optional policy. Students may submit self-reported scores if they choose for purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
5. Arrange for English proficiency test scores to be submitted if English is not their native language.
6. Submit two letters of recommendation, including one from an academic professor/ instructor (optional).
7. A personal statement describing a special interest, experience or achievement that is important and meaningful to you

In addition, applicants should be aware that:

1. The $50 application fee is waived by applying online or by completing an on- or off- campus or virtual interview
2. An on- or off- campus or virtual 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 $500 deposit which will be credited to the first year University charges. It is non-refundable if the student decides not to attend Clarkson.

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 with 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 Policy
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, and 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 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:

1. Provides merit-based international scholarships to qualified applications;
2. Has an International Student Advisor on campus;
3. Supports several international student organizations; and
4. Has established a special office in Undergraduate Admission to support international students

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. 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), the PTE – Pearson Test of English, Duolingo Test of English Language or IELTS (International English Language Testing System) scores submitted (if English is not your primary language). For further information on these exams, please visit www.ets.org/toefl, https://pearsonpte.com/the-test/, https://englishtest.duolingo.com/edu or www.ielts.org/.

See the information regarding English requirements below.

The *SAT* Reasoning Test is 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 or schedule an interview via video or phone. 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. The awards vary according to the strength of the student's academic record. Students who accept the offer of admission must submit a $500 nonrefundable deposit to reserve a place in the entering class which will be credited to the first year University charges.

Admission Criteria for International Students
Students are selected for admission based on the following:

1. Academic performance in secondary school, college, or university, and class standing
2. Recommendations
3. Clarkson University has adopted a test optional policy for the 2021-22 admission cycle due to the impact of COVID-19 on availability and accessibility of standardized testing. Students may submit self-reported scores if they choose for the purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
4. TOEFL, PTE – Pearson Test of English, Duolingo or IELTS or ELITE PLUS or EF SET (English Proficiency) scores.
5. Participation in extracurricular events, community service, and sports
6. 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 ranging from $5,000 to $40,000 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

Clarkson University must verify all international students' English language proficiency when English is not a first language. This requirement, as part of the application process, must be completed prior to the issuance of a 'Certificate of Eligibility' for student status. Once the university has verified this requirement, and the applicant is accepted, the 'Certificate of Eligibility' may be used to obtain a student visa. Clarkson University requires one of the following language proficiency exams:

• TOEFL (Test of English as a Foreign Language): http://www.toefl.org
• IELTS (International English Language Testing System): http://www.ielts.org
• PTE (Pearson Test of English): https://pearsonpte.com/
• DET (Duolingo English Test): https://englishtest.duolingo.com/
• Applicants inside the USA who are enrolled in one of these two institutions: Open Hearts Language Academy (OHLA) or Education First (EF) University Preparation may submit one of these two English exams ELITE PLUS through (OHLA) and EF SET Level C2 (EF).

Admission of international graduate students requires minimum test scores as below, in all programs excluding DPT, MS in PAS, and MS in OT:

> IBT TOEFL score of 80; TOEFL Essentials 8.5; IELTS band score of 6.5; PTE score of 56; DET score of 115 (or 61 on pre-July 2019 exam scoring); IELTE PLUS 80; EF SET level C2 80.

A TOEFL/IELTS/PTE/DET/IELTE PLUS/EF SET (C2) official score must be submitted as part of the application requirement. Admission Requirements to the language proficiency exam may be waived with evidence of documentation showing the student studied in a United States school or originated from a country with English as its first language. Students may submit on a case-by-case basis other proof of English proficiency. Requests for waiver of exams should be sent to the Coordinator of International Students.

I-20 Visa

U.S. Citizenship and Immigration Services (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.

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.. Please check the 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 https://www.usembassy.gov/. Further international information can be obtained at https://www.clarkson.edu/international-center.

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:

1. 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;
2. 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;
3. Maintained a minimum grade-point average of 3.500 in their major; and
4. 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

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. Exclusions to the automatic acceptance practice may be in effect per program requirement.

Part-Time Matriculated Students
A person may pursue a baccalaureate degree as a part-time matriculated student. For further information, contact sas@clarkson.edu.

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 more 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..

Below is a list of AP scores and the transfer credit it translates to:

Biology		**Chemistry**	
AP Score	**Course Credits**	**AP Score**	**Course Credits**
1,2, or 3	No credit	1,2, or 3	No credit
4	BY 100 Biology Elective with Lab	4	CM 131 General Chemistry
5	BY 140/142 and BY 160/162 Biology I and II with labs	5	CM 131/132 General Chemistry I/II

Computer Science*	
AP Score	**Course Credits**
1,2, or 3	No credit
4 or 5	CS 141 Intro. To Computer Science

English			
AP Score	**Language and Culture Credit**	**AP Score**	**Literature and Culture Credit**
1,2, or 3	No credit	1,2, or 3	No credit
4 or 5	COMM 210 Theory of Rhetoric	4 or 5	LIT 101 Literature and Writing
Mathematics**			
AP Score	**Calculus AB Credit**	**AP Score**	**Calculus BC Credit**
1,2, or 3	No credit	1,2, or 3	No credit
4 or 5	MA 131 Calculus I	4	MA 131 Calculus I
		5	MA 131/ 132 Calculus I/II

Physics***				
AP Score	**Physics 1 Credit**	**Physics 2 Credit**	**Mechanics**	**Electricity & Magnetism**
1,2, or 3	No credit	No credit	No credit	No credit
4 or 5	SC 141 Intro to Physics I	SC 142 Intro to Physics II	PH 131 Physics I	PH 132 Physics II

**The Computer Science Department schedules an exam in C++ or Java for new students during the fall orientation each year. Students earning a satisfactory grade receive credit for CS 141 Introduction to Computer Science I. The exam may also be taken in other pre-approved languages. Contact the Computer Science Department for more information.*

***To be eligible for AP credit MA 131 or MA 132, first year students must also perform at a satisfactory level of the Math Readiness Survey (which is taken in late May) or successfully complete the on-campus advanced-standing exam given in the first week of the fall semester.*

****Credit awarded for Physics 1 or Physics 2, non-calculus-based physics, will not substitute for PH 131 and/ or PH 132 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 college 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 course curriculum.

Credit by Examination
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 fall orientation need make no special arrangements. These exams are scheduled into orientation.

Clarkson will consider the following for advanced credit: AP, CLEP, GCE A-levels, IB, OACs, French Baccalaureate, 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. Advanced Placement credit based on tests or examinations (includes AP, CLEP, IS, etc.) will be limited to a combined 30 credit hours.

THE DAVID D. REH SCHOOL OF BUSINESS

Stephen Standifird, Interim Dean
Floyd Ormsbee, Associate Dean of Operations and Student Success

The Clarkson University David D. Reh 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, career mobility and flexibility that are among the best in the nation.

The mission of the Clarkson University David D. Reh School of Business is to integrate high-impact, interdisciplinary scholarship, with teaching excellence to develop business leaders who combine business acumen, analytical thinking, technical expertise, and a global perspective to benefit business and society.

In an effort to achieve this mission, the Reh School of Business has built a world-class faculty and created a curriculum that requires hands-on learning, provides ample opportunities to develop leadership skills, and builds professional networks inside and outside the classroom. The Reh 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 areas that span the traditional functional boundaries: Global Supply Chain Management, Engineering & Management, Innovation and Entrepreneurship, Financial Information and Analysis, and Business Analytics. In doing so, our curriculum allows students to develop expertise in the traditional business disciplines – accounting, finance, marketing, management, operations, and data analytics – and then to clearly see how they fit together in the real world. We also offer the opportunity for students with a more general interest in business to major in Business Administration. This major allows students to select their elective courses from the various disciplinary areas that are of interest to them and their career aspirations. This gives our graduates a balance of disciplinary expertise and 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 Innovation and Entrepreneurship.

The secret to implementing these ideas is simple to explain, but difficult for most schools to imitate. We offer an innovative first-year program for undergraduates, in which students invent and then plan a real business; we offer multiple opportunities for

hands-on learning; we help students build a professional network; we offer an integrated, technology-infused curriculum; and we start all of this early, at the beginning of the 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, 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 effective team members, and work well with customers, suppliers, colleagues, and the community. Written, oral, and technological communication skills are integrated into the entire 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 Reh School of Business students are required to have an international experience (either a traditional semester abroad, a two- to three-week faculty-led trip, a Canadian Studies course with several faculty-led weekend trips to Canadian cities, or an international summer internship) Students are also required to participate in a professional experience (such as an internship or a work co-op). Additionally, all students are encouraged to participate in campus organizations and professional societies. Clarkson University's strong programs in engineering and science provide special opportunities for students who wish to combine management with science or technical interests.

The David D. Reh School of Business's undergraduate and graduate programs 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.

Undergraduate Business Programs
Our undergraduate programs resulting in the Bachelor of Science degree include:

- Business Administration
- Business Analytics
- Global Supply Chain Management
- Innovation and Entrepreneurship
- Financial Information and Analysis
- Engineering and Management

We offer a range of minors including Economics, Law Studies,, New Product Development & Marketing, and Project Management.*

All Bachelor of Science degree candidates must successfully complete the Clarkson Common Experience and all requirements of their major, for a total of 120 credits. Additionally, all Bachelor of Science degree candidates pursuing a business degree must complete an international educational experience and a professional experience.

- Successful completion of a minor requires completion of all prerequisites and courses designated for the minor. It is the student's responsibility to declare a minor early enough to complete all requirements. Minors require at least 15 credit hours of relevant course work and at least 6 credit hours must be taken outside the student's major field.

Common First and Second-Year Business Curricula

The undergraduate programs offered by The Reh School of Business (with the exception of Engineering & Management) share a common curricula for the first two years, which are designed to provide flexibility so students are exposed to a variety of courses. Students will have formal and informal opportunities to learn about our majors, minors, and career opportunities so that they can make an appropriate choice about their academic path. Students will meet virtually with their academic advisor the summer prior to their enrollment at Clarkson where they will go over their individual academic plan, looking at any deviations from the common curriculum that may be necessary.

With the exception of Engineering & Management, courses students take are virtually identical for all Reh School of Business students during those first two years, so a student need not declare a major until the end of their sophomore year. Freshmen who enroll as undecided business majors are considered to be fully matriculated in the School of Business and do not need any additional applications to the Reh School of Business. Within the first two years, students will select their specific program of interest.

Common First and Second Year Business Curriculum (Engineering and Management majors, see section below)					
First Semester		**Credits**	**Second Semester**		**Credits**
EC 150	Principles of Microeconomics	3	EC 151	Principles of Macroeconomics	3
MA 180	Introductory College Mathematics**	3	IS 110	Intro to Business Intelligence & Data Analytics	3
SB 113	Entrepreneurship & Business Innovation I*	3	MA 181	Basic Calculus	3
UNIV 190	The Clarkson Seminar	3		Science Course (without/ lab)(BY, CM, PH, or SC)	3
FY 100	First-Year Seminar	1		Non-Business Elective	3
Total		13	Total		15

Third Semester		Credits	Fourth Semester		Credits
OS 286	Organizational Behavior	3	OS352	Strategic Human Resource Management	3
AC 202	Financial Accounting	3	MK 320	Principles of Marketing	3
LW 270	Law and Society I	3	AC 203	Managerial Accounting	3
	Science w/Lab BY,CM,PH or SC	4	OM 331	Operations & Supply Chain Management	3
STAT 282	General Statistics	3		Non-Business Elective w/C Points****	3
Total		16	Total		15

*Transfer students are required to take an upper-level School of Business elective 300 level of above in place of SB 113.
**Students must complete a basic calculus course (MA 181). MA 131- Calculus I can be substituted for MA 181.
***Students considering the Business Analytics major should take IS 301
****Students wishing to major in Business Analytics should take IS 237 Introduction to Programming and Application Development, or CS 141 Introduction to Computer Science (4 credits), or EE 261 Introduction to Programming and Software Design in the sophomore year.

BS in Business Administration

The B.S. degree in Business Administration provides students with great flexibility in their choice of electives (both professional electives within and outside of The Reh School of Business). Business is a vitally important part of our society, and every organization requires workers with skills in decision making, activity coordination, motivating people, and performance evaluation. Everyone interfaces with manufacturing, service, and governmental organizations throughout their lives. Thus, it is important that students understand the primary functions involved in managing these organizations. The B.S. in Business Administration combines a general background in business and management that is tailored to meet their areas of interest with the skills and knowledge that prepares them well to face these challenges.

Curriculum

Students earning a degree in Business Administration must meet degree requirements that consist of 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; and 45 elective credits comprised of 18 credits of business/professional electives and 27 credits of free electives to complete 120 hours.

As a result of the flexibility built into the program, many career paths are open to students who pursue the B.S. degree program in Business Administration. These include leadership positions such as managers, production planners, sales managers, information system managers, management consultants, training supervisors, contract administrators, financial analysts, small business managers and owners, and department managers. Students will also be prepared to take positions in local, state and federal government, as well as in service agencies.

Business Core

AC202	Financial Accounting
AC203	Managerial Accounting
EC150	Principles of Microeconomics
EC151	Principles of Macroeconomics
EC311	Intro to Econometrics
FN361	Financial Management
IS110	Intro to Business Intelligence and Data Analytics
LW270	Law and Society I
MK320	Principles of Marketing
OM331	Operations and Supply Chain Management
OS286	Organizational Behavior
OS352	Strategic Human Resource Management
OS432	Organizational Policy and Strategy
SB113	Entrepreneurship and Business Innovation I

Sample Business Professional Electives

AC305	Cost Accounting
AC311	Intermediate Financial Accounting I
AC312	Intermediate Financial Accounting II

AC407	Taxation
AC421	Accounting Information Systems
AC431	Advanced Accounting
AC436	Auditing
EC360	Environmental Economics
EC451	Industrial & Supply Chain Economics
EC475	Personnel Economics
FN455	Venture Capital
FN462	Investments
FN464	Financial Management II
FN467	International Finance
FN468	Financial Markets
FN470	Strategic Financial Management
FN474	Models for Financial Analysis
IS237	Introduction to Application Development
IS301	Applied Data Analytics
IS314	Database Design and Management
IS400	Applied Machine Learning
IS415	Data Warehousing for Analytics
IS426	Big Data Architecture
IS428	Information Systems for Supply Chain Management
IS437	Data Analytics Project: Planning, Development, and Data Analysis
LW352	Reading for the Law: Legal Issues Through Non-Fiction Literature
LW466	The Law of the Workplace
LW471	Law and Society II
MK321	Consumer Behavior
MK332	Marketing Research

MK436	Creativity, Innovation & New Product Development
OM341	Supply Chain Design & Management
OM371	Strategic Sourcing
OM380	Project Management
OM451	Quality Management & Lean Enterprise
OM476	Management of Technology
OS452	Advanced Human Resource Management
OS466	Negotiations and Relationship Management
SB114	Entrepreneurship & Business Innovation II
	Other SB courses?

The following would be a sample third and fourth year plan. There is enough flexibility that students studying abroad during the third year should still be able to complete the degree requirements.

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
EC 311	Introduction to Econometrics	3		Free Elective	3
FN 361	Financial Management	3		Free Elective	3
	Professional Elective I	3		Professional Elective II	3
	Non-Business Elective	3		Knowledge Area Requirement	3
	Non-Business Elective	3		Non-Business elective	3
SB 310	Professional Experience		UNIV 399	Global Experience	3
Total		**15**	**Total**		**18**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
	Professional Elective III	3		Professional Elective V	3
	Professional Elective IV	3		Professional Elective VI	3
OS 432	Organizational Policy & Strategy	3		Knowledge Area Requirement	3
	Knowledge Area Requirement	3		Free Elective	3
	Free Elective	3		Free Elective	3
Total		**15**	**Total**		**15**

BS in Business Analytics

Business Analytics involves tools and practices that drive access, analysis, and interpretation of business data. This analysis leads to improved decision making and performance across the value chain. These tools and skills are essential in today's data driven economy. The Bachelor of Science in Business Analytics degree will help create process-oriented information managers with the ability to develop keen data-driven insights into business problems and solutions. Graduates will be able to work effectively with a range of organizational stakeholders with varying knowledge and skill bases - from data scientists to field salespeople. Graduates will be able to identify and use proper data and analysis tools for effective problem solving and importantly, will be able to communicate information effectively across the organization to promote and support clear, balanced, and transparent decision-making. Students graduating with the Business Analytics major will have the following knowledge and skills:

1. An understanding of the components of information systems: Enterprise Resource Planning platforms, Business Intelligence, Database Management Systems, Data Analytics Technologies, and emerging innovations in the field
2. An understanding of, and experience with, the software application design, development, and deployment process
3. The ability to use industry-recognized business systems, such as SAP ERP, and analysis tools, such as Microsoft Excel
4. An understanding of the business requirements underlying all data collection and analysis
5. The ability to work closely with business practitioners across all disciplines to help provide the data and analysis that is necessary and relevant for organizational decision makers

6. A working knowledge of databases, including structure and usage in multiple business contexts across disciplines, industries, and organizations, and fundamental knowledge of tools such as SQL (Structured Query Language)
7. A working knowledge of data collection methods, including structured and unstructured data, and the process by which the data is extracted, transformed, and loaded into the various types of information systems for analysis
8. The ability to perform a variety of data analyses, such as pivot table analysis, optimization, and statistical analysis
9. The ability to communicate the results of data analysis to organizational decision makers and other stakeholders in different forms, including reports, tables, graphs, as well as real-time visualization tools and dashboards

Graduates with a Business Analytics degree will have a great deal of flexibility upon graduation. They may become data acquisition experts or analysts, database administrators, or pursue a graduate degree in the data science field. They may also pursue a career in the more traditional information systems field such as IT project managers or enterprise system consultants.

Students earning a degree in Business Analytics must 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; 21 credits of specialized courses to satisfy the major requirements; and six credit hours of professional electives.

Note that 50% of coursework must be taken outside the School of Business, 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	
IS 237 Or **CS 141 Or** **EE 261**	Introduction to Application Development Introduction to Computer Science Introduction to Programming and Software Design
IS 301	Applied Data Analytics
IS 314	Database Design and Management
IS 400	Applied Machine Learning
IS 415	Data warehousing for Analytics
IS 426	Big Data Architecture

IS 437	Data Analytics Project: Planning, Development, and Data Analysis

Students choose 2 Professional Electives from the following: (not all courses offered every semester)	
CS 460 / EE 468	Database Systems
EM 333	Elements of Operations Research (pre-requisite courses include MA 131, MA 132, and STAT 383)
IS 428	Information Systems for Supply Chain Management
OM 380	Project Management

The following would be the sample 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, students should always consult with their academic advisor prior to studying abroad. 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.

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
FN 361	Financial Management	3	IS 415	Data Warehousing for Analytics	3
IS 314	Database Design and Management	3	IS 237	Introduction to Application Development	3
EC 311	Introduction to Econometrics	3	IS 301	Applied Data Analytics	3
	Non-Business Elective Course	3		Professional Elective Course	3
	Non-Business Elective Course w/Comm Points	3		Non-Business Elective Course w/Comm Points	3
SB 310	Professional Experience	0	UNIV 399	The Global Experience	3

Total	**15**	**Total**	**18**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
IS 400	Applied Machine Learning	3	IS437	Data Analytics Project: Planning, Development, and Data Analysis	3
IS 426	Big Data Architecture	3	OS 432	Organizational Policy and Strategy	3
	Free or Non-Business Elective Course	3		Professional Elective Course	3
	Free or Non-Business Elective Course	3		Free or Non-Business Elective Course	3
	Knowledge Area Course	3		Free or Non-Business Elective Course	3
Total		**15**	**Total**		**15**

BS In Global Supply Chain Management

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 phase and includes raw material sourcing and 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:

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

Students earning a degree in Global Supply Chain Management must 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.

Required Courses:	
EC 451	Industrial and Supply Chain Economics
IS 428	Information Systems for Supply Chain Management
OM 341	Supply Chain Design and Management
OM 371	Strategic Sourcing Management
OM 451	Quality Management and Lean Enterprises
OS 466	Negotiations and Relationship Management
SB 441	Advanced Topics in Global Supply Chain Management
Professional Electives (Choose two): (Not all courses offered every semester)	
AC 305	Cost Accounting
IS 301	Applied Data Analytics
IS 314	Database Design and Management
LW 471	Law and Society II
MK 332	Marketing Research
MK 436	Creativity, Innovation & New Product Development
OM 380	Project Management
OM 476	Management of Technology
SB381	Logistics Management

The following would be a sample third and fourth year plan. There is enough flexibility that students studying abroad during the third year should still be able to complete the degree requirements. A student wishing to study abroad should consult their academic advisor when selecting courses abroad to make sure that they will satisfy degree requirements.

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
FN 361	Financial Management	3	OS 466	Negotiations & Relationship Management	3
EC 311	Introduction to Econometrics	3	OM 341	Supply Chain Design and Management	3
OM 371	Strategic Sourcing	3	OM 451	Quality Management & Lean Enterprise	3
	Free or Non-Business Elective	3		Professional Elective	3
	Non-Business Elective w/Comm Points	3		Non-Business Elective w/Comm Points	3
SB 310	Professional Experience	0	UNIV 399	The Global Experience	3
Total		**15**	**Total**		**15**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
SB 441	Advanced Topics in Global Supply Chain Management	3	OS 432	Organizational Policy & Strategy	3
EC451	Industrial Supply Chain Economics	3		Professional Elective	3
	Free or Non-Business Elective	3	IS 428	Information Systems for Supply Chain Management	3
	Non-Business Elective	3		Non-Business Elective	3
	Non-Business Elective	3		Free or Non-Business Elective	3
Total		**15**	**Total**		**15**

BS In Innovation and Entrepreneurship

The Innovation and Entrepreneurship (I&E) major is designed to leverage existing strengths in innovation and entrepreneurship by offering students a cross-disciplinary, flexible major that provides them with the knowledge and skills to:

1. Develop and manage the innovation process
2. Plan and commercialize innovations
3. Evaluate and manage innovation opportunities
4. Participate in and manage ideation and the new product development process
5. Understand the legal and policy issues associated with new ventures
6. Stimulate and manage the creation of new business enterprises both within an 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 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 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. 50% of coursework must be taken outside the School of Business.

Required Courses	
EC 370	Economics of Innovation
SB 322	Designing and Leading Innovation Ventures
SB 440	Innovation and Entrepreneurship Strategy
SB 437	Commercializing Innovation
MK 321	Consumer Behavior
MK 332	Marketing Research
MK 436	Creativity, Innovation & New Product Development

Students choose Two Professional Electives:	
AC 305	Cost Accounting
AC 407	Taxation of Business Entities

FN 455	Venture Capital and Private Equity
IS 301	Applied Data Analytics
LW 471	Law and Society II
LW 466	Law of the Workplace
OM 380	Project Management
OM 476	Management of Technology
OS 452	Advanced Human Resource Management

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. Students are encouraged to meet with their advisors prior to going abroad to make sure that all courses taken while abroad will meet degree requirements.

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
EC 311	Introduction to Econometrics	3	MK 322	Marketing Research	3
FN 361	Financial Management I	3	SB 322	Designing & Leading Innovative Ventures	3
MK321	Consumer Behavior	3		Professional Elective	3
	Free Elective	3		Non-Business Elective w/Comm Points	3
	Non-Business Elective w/Comm Points	3		Free or Non-Business Elective	3
SB 310	Professional Experience	0	UNIV 399	The Global Experience	3
Total		**15**	**Total**		**18**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits

MK 436	Creativity, Innovation, & New Product Development	3	OS 432	Organizational Policy & Strategy	3
EC 370	Economics of Innovation	3	SB 440	Commercializing Innovation	3
	Professional Elective	3	SB437	Innovation & Entrepreneurship Strategy	3
	Knowledge Area	3		Non-Business	3
	Free or Non-Business Elective	3		Free Elective	3
Total		**15**	**Total**		**15**

BS in Financial Information and Analysis

The field of Financial Information and Analysis (FIA) provides students with expertise in a 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 ability to succeed in the workplace through the integration of the traditional functions of finance and accounting.

The FIA curriculum gives each student a fundamental knowledge of managerial and cost accounting and financial statement analysis. Career opportunities for graduates in FIA can be found in the fields of 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 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 , most of the electives, depending on courses chosen for the Clarkson Common Experience, will need to be taken outside the School of Business.

Required Courses	
AC 305	Cost Accounting

AC 311	Intermediate Financial Accounting I
AC 312	Intermediate Financial Accounting II
FN 462	Investments
FN 464	Financial Management II
FN 470	Strategic Financial Management
Students choose 3 Professional Electives from the following (not all courses offered every semester):	
AC 436	Auditing
FN/EC 468	Financial Markets and Institutions
FN 455	Venture Capital and Private Equity
FN 467	International Finance
FN 474	Models for Financial Analysis
FN 575 and/ or FN 576*	Professional Fund Management I Professional Fund Management II (must total at least 3 credits)
IS301	Applied Data Analytics
LW 471	Law and Society II

*FN 575/ FN 576 may be used for only one professional elective. This course is by permission of the instructor only.

The following would be the sample 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.

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
FN 361	Financial Management I	3	AC 311	Intermediate Financial Accounting I	3
EC 311	Strategic Human Resource Management	3	AC 305	Cost Accounting	3

	Non-Business Elective w/Comm Points	3	FN 462	Investments	3
	Free Elective	3		Professional Elective	3
	Non-Business Elective	3		Non-Business Elective w/Comm Points	3
SB 310	Professional Experience	0	UNIV 399	The Global Experience	3
Total		**15**	**Total**		**18**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
AC 312	Financial Reporting and Analysis II	3	FN 470	Strategic Financial Management	3
FN 464	Financial Management II	3	OS 432	Organizational Policy and Strategy	3
	Non-Business Elective	3		Professional Elective	3
	Knowledge Area	3		Free Elective Course	3
	Professional Elective Course	3		Non-Business Elective Course	3
Total		**15**	**Total**		**15**

BS in Engineering & Management

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 meets 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, and science. The carefully planned curriculum is taught by faculty within their respective areas of expertise.

The E&M program prepares students to:

1. Apply technical problem solving skills to develop innovative, effective, and sustainable solutions to complex problems
2. Lead multi-disciplinary teams to success by managing team dynamics
3. Effectively communicate information for decision-making both orally and in writing to both technical and non-technical audiences
4. Continuously balance simultaneous demands of today's global environment through multi-tasking capabilities of planning, organizing, managing and controlling resources
5. Combine engineering and business core knowledge and apply quantitative and qualitative methods to process analysis in business systems
6. Make timely, ethical and useful decisions in response to organizational challenges

Upon completion of the program , students will be able to:

1. Have the ability to apply calculus-based math, laboratory science, and engineering principles to technical problem-solving.
2. Gain the knowledge and abilities to lead multi-disciplinary teams.
3. Understand development and maintenance of relationships among people within and across organizations.
4. Build a skill set in written and oral communication through coursework, projects, and extracurricular activities.
5. Balance academic disciplines in science, engineering, business, and humanities to prepare for the changing workplace.
6. Understand financial and information flows within and across organizations.
7. Learn both quantitative and qualitative analysis methods.
8. Apply a foundation of business and management principles to making timely, ethical, and useful decisions.
9. Learn to lead and manage organization change.

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.

Students work closely with their advisor to select electives that best suit these objectives and are encouraged to use program professional electives to focus on specific career objectives.

Engineering & Management Curriculum						
First Year						
	Fall	**Delete Cell**			**Spring**	
Course	Title	**Delete Cell**	Credits	Course	Title	Credits
CM 131	Chemistry I	**Delete Cell**	4	CM132	Chemistry II	3 4
EM 120	Team-Based Design & Innovation [1,3]	**Delete Cell**	3	EM121	Technological Entrepreneurship [1, 3]	2
IS 110	Intro to Business Intelligence & Data Analytics [2, 3]	**Delete Cell**	3	EM 205	Intro to Financial & Managerial Accounting	3
MA 131	Calculus I	**Delete Cell**	4		Free Elective or Knowledge Area	3
UNIV190	The Clarkson Seminar	**Delete Cell**	3	MA132	Calculus II	3
FY 100	First-Year Seminar	**Delete Cell**	1			
Total			**18**	**Total**		**15** [5]

Second Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
EC 350	Economic Principles & Engineering Economics [6]	3	LW 270	Law and Society I	3
EM 286	Organizational Behavior	3	ES 220	Statics	3
EM 380	Project Management	3	PH 132	Physics II	4
STAT 383	Applied Statistics [I, 7]	3	MA232	Differential Equations	3
PH 131	Physics I	4	EM 331	Operations & Supply Chain Management	3
Total		**16**	**Total**		**16**

Third Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
EM 333	Operations Research	3	UNIV 399	Global Experience	3
ES 260 Or ES 222 Or EE 264	Materials Science Or Strength of Materials Or Digital Design1	3	EM 451	Quality Management & Lean Enterprise	3
ES 330	Fluid Mechanics	3	ES 250	Electrical Science	3
MA 231	Calculus III	3	FN 361	Financial Management	3
MK 320	Principles of Marketing	3		Professional Elective	3
EM 310	Professional Experience	0			
Total		**15**	**Total**		**15**

Fourth Year					
	Fall			**Spring**	
Course	Title	Credits	Course	Title	Credits
COMM 217	Public Speaking [1]	3	EM 456	Process Engineering & Design [1,3,4]	3
EM 432	Organizational Policy & Strategy [1]	3	EM 313	Professional Communication	3
ES 340	Thermodynamics	3		Professional Elective	3
	Knowledge Area	3		Free Elective	3
	Professional Elective	3			
Total		**15**	**Total**		**12**

[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 EM 456 or another senior capstone design course approved by the Director of E&M or the Associate Dean of Undergraduate Programs.

[6] Students who submit transfer credit for EC 150 or EC 151 prior to matriculation can complete their EC 350 requirement by taking EC 200 for one credit
[7] Students who have taken MA 330 are exempt from taking STAT 383

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. 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.

3+1 B.S./M.B.A. Degree Program

The 3+1 B.S./M.B.A. degree program is designed for highly motivated students seeking to accelerate their education and enter the workforce with both a Bachelor of Science (B.S.) and a Master of Business Administration (M.B.A.) in just four years. This program combines the foundational knowledge and skills of an undergraduate business education with the advanced leadership, strategic, and analytical expertise gained through graduate-level study.

Curriculum

- Completion of both degrees in an accelerated timeframe.
- Development of advanced business competencies in leadership, strategy, and decision-making.
- Structured advising to ensure timely and successful program completion.

Students in the 3+1 BS/MBA program will complete all requirements for their bachelor's degree by the end of the third academic year and all requirements for their master's degree by the end of the fourth year. To meet this schedule, students will take 18 credits each fall and spring semester and 6 credits each summer semester during the first three years of study. While completing the bachelor's degree, students may earn waivers for up to three graduate courses, as approved by the program. During the spring semester of the third year, students will complete two approved graduate-level courses; these courses apply concurrently to the bachelor's degree and the M.B.A. In the fourth year, students will complete all remaining graduate coursework.

Students must maintain a minimum cumulative undergraduate GPA of 3.3 to remain in the program. All undergraduate majors within the Reh School of Business are eligible for the 3+1 program; refer to each major description for specific degree requirements. Students will work closely with their academic advisor to develop and follow an individualized plan of study.

Minors and Concentrations in Business

Business Minor
The minor in business is designed for students with a major outside of the Reh 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:

AC 205	**Introduction to Accounting for Decision Analysis**
EC 150 or **EC 350***	Principles of Microeconomics Economic Principles and Engineering Economics
EC 151 or **EC 350***	Principles of Macroeconomics Economic Principles and Engineering Economics
FN 361	Financial Management I
LW 270	Law and Society I
MK 320	Principles of Marketing
OM 331	Operations and Supply Chain Management
OS 286	Organizational Behavior

*Students who complete EC 350 – Economic Principles and Engineering Economics are exempt from taking EC 150 and EC 151. EC 350 covers material from both EC 150 and EC 151. EC 350 will satisfy one course towards the minor. Students must then choose their remaining five classes from AC 205, LW 270, OS 286, FN 361, OM 331, or MK 320.

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 15 credit hours of economic courses as follows:

Choose five courses from the following list (NOTE: Students who take EC150/151 cannot take EC350 and vice versa): (Please note that not all classes are offered every semester)

- EC150 Principles of Microeconomics
- EC151 Principles of Macroeconomics
- EC350 Engineering Economics
- EC311 Econometrics
- EC360 Environmental Economics*
- EC370 Economics of Innovation*
- EC451 Industrial and Supply Chain Economics*
- EC468 Financial Markets and Institutions**
- EC475 Personnel Economics***

***** Requires EC150/EC350 as a prerequisite.
****** Requires FN361 as a prerequisite, which requires EC150/EC350 and AC203 or AC205.
******* Requires EC150 as a prerequisite.

Minor in Product Development & Marketing
This minor is for students interested in exploring concepts and tools associated with the design and marketing of new products. Courses support four dimensions of product development: a) new product planning - plan and develop the entire lifecycle of a product, b) understanding the social and environmental impact of technical solutions, c) establishing functional, technical, and aesthetic components of product design, and d) generating virtual and physical prototypes.

Coursework in this minor also supports learning about marketing new products, including crafting a clear message, identifying appropriate distribution channels, customer acquisition and engagement, customer co-innovation, and using social media and analytics to manage messaging. All students choosing to minor in Product Development and Marketing must complete 15 credit hours (five courses), maintain a 2.0 cumulative average in minor courses, and satisfy the requirements indicated below.

Students must take five of the following six courses:
SB322 Designing and Leading Innovative Ventures
MK320 Principles of Marketing
MK/PY321 Consumer Behavior (Prereq: MK320)
MK332 Marketing Research (Prereq: MK321 & STAT282 or STAT283)
MK436 Creativity, Innovation, and New Product Development
COMM416/516 Placemaking, Marketing, and Promotion

Required: New Product Development and Marketing Portfolio (MK419 – 0 credit P/F)*.

NOTE: Students majoring in Innovation and Entrepreneurship are ineligible for the Product Development and Marketing Minor.

*Students must complete a 0-credit new product development and marketing portfolio (MK 419) to maintain a repository of work from the minor classes related to work during their time at Clarkson.

The portfolio will include material from four design projects completed by the student during their Clarkson experience.

Minor in 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 the 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 Quality Management 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 "Project Management," students must maintain a 2.0 average in the five (5) three-credit courses, distributed in the following fashion:

Students must take the following courses:
OS/EM/PY286 Organizational Behavior
OM/EM380 Project Management
OM/EM451 Quality Management and Lean Enterprise
OM/EM331 Operations and Supply Chain Management

Students must take at least two of the following courses:
PY151 Introduction to Psychology
OS352 Strategic Human Resource Management
OS466 Negotiations and Relationship Management
OM/EM476 Management of Technology

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. Students will receive a department certificate upon successful completion of the concentration. There will be no notation on the students transcript.

Three required courses:	
EM 341	Supply Chain Design & Management
EM 381	Logistics Management
EM 371	Strategic Sourcing
Students must choose two courses from the following:	
OS 466	**Negotiations and Relationship Management**
IS 428	Information Systems for Supply Chain Management
EM 451	Quality Management & Lean Enterprises

Co-ops, Internships, and Professional Experience Requirement

Students are required to gain a minimum of 150 hours of professional work experience and are encouraged to participate in a Co-op or Internship Program. Please refer to the Career Center for more details on these programs and tools to aid students in securing these positions.

Global Study Requirement

All business majors are required to complete a global experience requirement. Students interested in cultural and trade relations between the United States and other countries may participate in the University International Student Exchange Program. Qualified students will typically complete a study exchange for at least one semester at a partner institution. Please refer to the International Center for more details on this program. Other options available for the student to fulfill the global study requirement include participation in a two or three week faculty led trip (UNIV 399 Global Business Experience or UNIV 267 Into to Canada) Students should speak with their academic advisor early in their academic career to explore all options for this requirement.

WALLACE H. COULTER SCHOOL OF ENGINEERING & APPLIED SCIENCES

“Technology Serving Humanity”

William Jemison, Dean
Doug Bohl, Associate Dean for Academic Programs

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 funded five key areas: team project-based learning activities; endowed chairs and endowed fellowships; a new program in rehabilitation biomedical 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 Aerospace Engineering. Faculty and students also participate in the interdisciplinary Engineering and Management, Software Engineering, and Undergraduate Interdisciplinary Minors. More information can be found in the Interdisciplinary Program section of the catalog.

Undergraduate Programs
The undergraduate Bachelor of Science degrees granted in engineering, with specialization in one of the nine programs accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org are as follows:

1. Aerospace Engineering
2. Chemical Engineering
3. Civil Engineering
4. Computer Engineering
5. Electrical Engineering
6. Engineering & Management *Program details may be located in Reh School section of the catalog
7. Environmental Engineering
8. Mechanical Engineering
9. Software Engineering * Program details may be located in the Interdisciplinary section of the catalog

Additional undergraduate Bachelor of Science degrees conferred in the Coulter School of Engineering and Applied Science include:

1. Applied Mathematics and Statistics
2. Biochemistry
3. Chemistry
4. Computer Science
5. Data Science
6. Mathematics
7. Physics

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 serve 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 affords students with an opportunity to matriculate toward the completion of an engineering degree program within the School of Engineering prior to selecting a specific degree program. Undergraduates may choose between; Aerospace Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering and Software Engineering.

Combined BS Engineering MBA or MS/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.

Pre-Law
Please see the Pre-Professional Program section of the catalog for more information.

Engineering Student Organizations and Design Competitions
In addition to the University organizations, Clarkson has student-led chapters of the following professional organizations:

1. American Indian Science and Engineering Society
2. American Institute of Aeronautics and Astronautics
3. American Institute of Chemical Engineers
4. American Society of Civil Engineers

5. American Society of Mechanical Engineers
6. Association of General Contractors
7. Associated Schools of Construction
8. Institute of Electrical and Electronic Engineers
9. National Society of Black Engineers
10. New York Water Environment Association
11. Society for Hispanic Professional Engineers
12. Society of Automotive Engineers
13. Society of Women Engineers

Each department has an honorary society, and there is an all-engineering honorary society. Students can participate in national competitions.

1. Chem E Car
2. Clean Snowmobile
3. Concrete Canoe
4. Construction Management
5. Design, Build, Fly
6. FIRST Robotics
7. Formula SAE
8. Formula SAE Electric
9. Human Powered Vehicle
10. Mini-Baja SAE
11. Rocketry Club
12. Steel Bridge
13. Timber Bridge

Transfer Programs
Both 2+2 and 3+2 transfer programs are available at Clarkson.

Undergraduate Engineering Programs

Common First-Year Engineering Curriculum in Engineering
For all majors the first two semesters are nearly identical in the undergraduate engineering curricula. Therefore, students may defer the selection of a major field of study until the beginning of 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.

Common First-Year Curriculum in Engineering*			
First Semester	**Credits**	**Second Semester**	**Credits**

CM 131	Chemistry I	4	CM 132/ BY 160/ CS 141	Chemistry II Biology II** Intro to Comp Science**	4
MA 131	Calculus I	3	ES 100	Engineering Use of the Computer	2
PH 131	Physics I	4	ES 110	Engineering and Society or equivalent***	3
FY/PE 100	First Year Seminar	1	MA 132	Calculus II	3
UNIV 190	The Clarkson Seminar	3	PH 132	Physics II	4
Total		15	Total		16

*This is a typical curriculum sequence, listing courses that are required for 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 and Aerospace Engineering majors can substitute BY 160 for CM 132. 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. Chemical, Civil, and Environmental Engineering require CM 132. Electrical, Computer, and Software Engineering require CS 141.

***ES 110 or equivalent is a required Knowledge Area course for engineering majors (except for University Honors Program Students). A total of five Knowledge Area courses must be taken, and these 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, EC 350 is required for most degrees.

BS In Aerospace Engineering
Marcias Martinez, Program Chair

Program Educational Objectives (PEOs):
The PEOs for the Aerospace Engineering program are to produce graduates who:

PEO1: competently apply engineering methods to solve professional problems associated with the design, development, manufacture, and maintenance of aerospace and related systems and understand the social, ethical, and environmental context of their work.

PEO2: communicate clearly with diverse and international communities, collaborate competently in cross-functional teams, and assume leadership roles while meeting the expectations of their employers.

PEO3: habitually engage in professional development.

Student Outcomes (SOs):
In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The Aerospace Engineering program expects that graduates have a depth of knowledge in aerodynamics, aerospace materials, structures, propulsion, flight mechanics, stability and control, as well as similar depth in at least two of the following topics: orbital mechanics, space environment, attitude determination and control, space structures, telecommunications, and rocket propulsion. It is also expected that graduates have

design competence and experience that includes integration of various disciplines within aerospace engineering.

Curriculum Overview: The 120-credit program contains 87 credit hours of required technical courses, 33 credit hours of electives (including one professional elective, one Aerospace professional elective, 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. Aerospace engineering laboratory courses add to this development.

Training in professional problem-solving begins in the fall 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. They may also 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 distinct knowledge areas. Communication intensive course requirements 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 elective and aerospace professional elective must meet criteria in the Mechanical and Aerospace Engineering (MAE) Department Student Handbook. One Aerospace Studies or Military Science course (400-level) may be used as the professional elective. The undesignated elective may be any college-level course that does not contain a significant amount of material already covered in other courses. It could be chosen to enrich the student's technical or

nontechnical background. Aerospace Studies or Military Science courses (200-level or above) may be used as the undesignated elective.

Aerospace Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
First Semester		**Credits**	**Second Semester**		**Credits**
MS/ AS	Military Science/ Aerospace Studies (if elected)	1	MS/ AS	Military Science/ Aerospace Studies (if elected)	1
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 220	Statics	3	AE 201	Intro to Experimental Methods in Mechanical & Aeronautical Engineering	1
ES250	Electrical Science	3	AE342	Intro to Comp Methods	3
ES260	Materials Science	3	ES 222	Strength of Materials	3
MA 232	Elementary Differential Equations	3	ES 223	Rigid Body Dynamics	3
AE 212	Intro to Engineering Design	3	MA 231	Calculus III	3
				KA/ UC Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
AE350	Aerospace Structures I	3	AE425	Aerodynamics	3
AE324	Dynamical Systems	3	AE 429	Aircraft Performance and Flight Mechanics	3

AE 301	Experimental Methods in Mechanical & Aeronautical Engineering	1	AE 401	Advanced Experimental Methods in Mechanical & Aeronautical Engineering	3
ES 330	Fluid Mechanics	3	AE 351	Aerospace Structures II	1
ES 340	Thermodynamics	3	MA 330*	Advanced Engineering Mathematics*	3
	KA/ UC Elective	3		Undesignated Elective	3
Total		16	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
AE 430	Stability Control of Aerospace Vehicles	3		Economics Elective	3
AE431	Gas Dynamics	3	AE451	Aircraft Design II	3
AE 450	Aircraft Design I	3		KA/ UC Elective	3
AE 427	Design of Propulsion Systems	3		Aerospace Professional Elective	3
	Professional Elective	3	ES 499	Professional Experience	0
Total		15	Total		12

*Students can alternatively take MA 331 and (STAT 383 or STAT 389)

BS In Applied Mathematics and Statistics
Guangming Yao, 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, 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, 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 applied math and statistics curriculum is designed so that students learn to:

1. Reason clearly, logically, and analytically;
2. Demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics;
3. Work effectively with standard mathematical software packages and write mathematical programs using a high-level computer language;
4. Apply mathematical knowledge to solve real-world, open-ended problems;
5. Read mathematical texts and literature and write mathematical proofs;
6. Communicate effectively, both orally and in writing; and
7. Work effectively both individually and in teams

In addition to the major in Applied Mathematics and Statistics, the Mathematics Department offers separate majors in:

1. Mathematics, with more emphasis on abstract mathematics and proof, including coursework that helps students to prepare for graduate study in math or statistics.
2. Data Science, which combines courses from mathematics, statistics, and computational science to help students develop the interdisciplinary, data-driven skill set needed to tackle real-world problems involving reasoning from vast volumes of data.

A student may not major in both Applied Mathematics and Statistics and either Mathematics or Data Science.

Program Requirements	
Area of study	**Credits**
Mathematics and Statistics*	44
Computer Science (CS 141)	4
Physics (PH 131 and PH 132)	8

Science (BY, CM, or PH)	3
First Year Seminar (FY 100)	1
The Clarkson Seminar (UNIV 190)	3
Knowledge Area/ University Courses	15
Application Electives**	15
Free Electives***	27
Total	120

*Required courses include MA 131, MA 132, MA 200, MA 211, MA 231, MA 232, MA 339, MA363, MA 377, MA 499, and STAT 383; three courses form the list MA 331, MA 332, STAT 381, STAT 382, STAT 384; plus either MA 451 or MA 453
**Application Electives are chosen from an approved list of courses from other departments; check with the department for details
***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 departments for details.

Applied Mathematics & Statistics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
MA 131	Calculus I	3	MA 132	Calculus II	3
PH 131	Physics I	4	PH 132	Physics II	4
CS 141	Computer Science I	4	MA 200	Math Modeling & Software	3
UNIV 190	Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective (CS 142 rec.)	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**

MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
MA 232	Differential Equations	3	MA 339	Applied Linear Algebra	3
	Science Elective	3	STAT 383	Probability and Statistics	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Application Elective	3		Application Elective	3
Total		15	Total		15

Applied Mathematics & Statistics Sample Curriculum					
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
MA 377	Numerical Methods	3	MA 363	Mathematical Modeling	3
	MA/ STAT Elective	3		MA/ STAT Elective	3
	Free Elective	3	MA 451/ MA 453	Intro to Math Research or Intro to Math Instruction	2
	KA University Course	3		KA/ University Course	3
	Application Elective	3		Application Elective	3
Total		15	Total		14
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	MA/ STAT Elective	3		MA/ STAT Elective	3
	Application Elective	3		Free Electives	12
	Free Electives	9	MA 499	Professional Experience	0
Total		15	Total		15

BS In Biochemistry
Program Director TBD

Science has undergone a remarkable transformation over the last few years, and nowhere has the impact been as 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 an impact on our lives as much as this one, and few offer the opportunities for individuals to make such a broad variety of contributions. Clarkson University's program in Biomolecular Science is designed to:

1. Develop within the student a solid and comprehensive knowledge base to meet the challenges of professional careers spanning the full range of the chemical and biomolecular sciences.
2. Create an intellectually stimulating and experience rich learning environment, with exposure to open-ended problems frequently encountered in real-world situations, to prepare the student for industry positions, graduate school and professional programs in the health sciences.
3. Support and encourage the development of excellent communication tools and practice in forming professional relationships and skills.

This is an 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 in their own areas of interest 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 an excellent preparation for entrance into professional schools in medicine and dentistry, or for the Doctor of Physical Therapy or Physician Assistant programs at Clarkson. Our alumni have reported they are solidly prepared for the Medical College Admission Test and ready to meet the challenges of medical school.

Required Courses	
BY 140	Biology I: Inheritance, Evolution and Diversity (3 credits)
BY 160	Biology II: Cellular and Molecular Biology (3 credits)
BY 162	Biology II Laboratory (2 credits)
BY 214	Genetics (3 credits)

BY 412	Molecular Biology Laboratory (4 credits)
BY 450	Biochemistry I (3 credits)
BY 451	Biochemistry II (3 credits)
BY 470	Biochemistry & Biotechnology Laboratory (3 credits)
CM 103*	Structure and Bonding (3 credits)
CM 104*	Chemical Equilibrium and Dynamics (3 credits)
CM 105*	Chemistry Laboratory I (2 credits)
CM 106*	Chemistry Laboratory II (2 credits)
CM 221	Spectroscopy (3 credits)
CM 223	Spectroscopy Laboratory (3 credits)
CM 241	Organic Chemistry I (3 credits)
CM 242	Organic Chemistry II (3 credits)
CM 244	Organic Chemistry Laboratory I (3 credits)
CM 371	Physical Chemistry I (3 credits)
CM 372	Physical Chemistry II (3 credits)
MA 131	Calculus I (3 credits)
MA 132	Calculus II (3 credits)
PH 131	Physics I (4 credits)
PH 132	Physics II (4 credits)
*	**CM131** and **CM132** may be used to satisfy the first year chemistry requirement for the Biomolecular Science degree.

Biomolecular Science Sample Curriculum *					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 103	Structure and Bonding	3	CM 104	Equilibrium and Dynamics	3

CM 105	Chemistry Lab I	2	CM 106	Chemistry Lab II	2
MA 131	Calculus I	3	MA 132	Calculus II	3
BY 140	Biology I	3	BY 160	Biology II	3
UNIV 190	Clarkson Seminar	3	BY 162	Biology II Lab	2
FY 100	First-Year seminar	1		KA Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 221	Spectroscopy	3	CM242	Organic Chemistry II	3
CM 223	Spectroscopy Lab	3	CM244	Organic Chemistry Lab	3
CM 241	Organic Chemistry I	3	BY 214	Genetics	3
PH 131	Physics I	4	PH 132	Physics II	4
	KA/UC Elective	3		KA/UC Elective	3
Total		16	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CM 371	Physics Chemistry I	3	CM372	Physical Chemistry II	3
BY 450	Biochemistry I	3	BY 451	Biochemistry II	3
	Statistics	3		Professional Elective	3
	Professional Elective	3		Professional Experience	3
	Free Elective	3		Free Elective	3
Total		15	Total		15

		Thesis Option			
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
BY 412	Molecular Biology Lab	4	BY 470	Biotechnology Lab	3
	KA/UC Elective	3		Professional Elective	3
CM491	Senior Thesis	6		Senior Thesis	6
	Free Electives	2			
Total		15	Total		12

*Students entering with AP credit or the addition of a minor or a 2nd major will make alternative course choices to meet their needs, therefore the curriculum shown is only an example. The curriculum will be discussed with the student's advisor before courses are selected for each semester.

4+1 Plan for Masters of Basic Science (MBS) & Interdisciplinary Bioscience & Biotechnology (IBB-MS) MS Degree Programs

Objectives
Provide academically-strong Clarkson undergraduates a head-start and rapid track to a bioscience M.S. degree.

Outcomes
4+1 M.S. Degree Students will:
1. Complete all of the requirements and meet the outcomes of the M.S. graduate program in which they matriculate
2. Complete the M.S. degree after one year of additional classwork beyond the B.S. degree

Program prerequisites
Students will apply in the junior year (5^{th} or 6^{th} semester) at Clarkson University.

Program requirements
1. Either a Clarkson University Biology or Biomolecular Science Major or else another Clarkson University major that has taken the introductory biology core (BY 140, 142, 160, 162) and genetics (BY 214)
2. GPA minimum of 3.25 overall and for Biology courses
3. Likelihood of completing undergraduate degree requirements plus two additional graduate courses during the senior year (7^{th} and 8^{th} semesters)
4. Short essay explaining why the student is motivated to pursue a MS degree
5. Specification of which MS program the student plans to pursue

Program
During the senior year (7th and 8th semesters), a student in the 4+1 MS program will take minimally three-credits (typically one course) graduate-level bioscience coursework each semester (500 or 600 level course with a BY designator). This graduate coursework will not count toward the undergraduate degree; it is in addition to the required 40 credits of BY designated coursework for the undergraduate degree. At the end of the senior year (upon graduation) the student will have completed at least 6 credits of the 30 credits required for a MS degree.

If the student has made adequate progress in the graduate coursework (grades B or better), the student will be immediately matriculated into the MS degree program and be granted graduate student status. During the 5th year (9th and 10th semesters), the student will be expected to complete all additional coursework and research/ project requirements of the graduate program (MBS or MS-IBB). This will require 12 credit hours each of the two semesters to complete the degree requirements.

BS In Chemical Engineering

Elizabeth Podlaha-Murphy, Program Chair

A BS degree in Chemical Engineering is a good foundation for many diverse careers.

Program Educational Objectives (PEOs)
Program graduates are expected to:
PEO1: practice chemical engineering* in continuing and emerging fields and/or

PEO2: be successful in pursuing advanced degrees

PEO3: be motivated to continually develop their knowledge and skills by, for example, taking continuing education or industry training course(s), and acquiring professional engineering certification

PEO4: contribute to society and the engineering profession.

**Here we define chemical engineering as the discipline that requires a thorough grounding in chemistry and a working knowledge of advanced chemistry; material and energy balances applied to chemical processes; thermodynamics of physical and chemical equilibria; heat, mass and momentum transfer; chemical reaction engineering; continuous and stage-wise separation processes; process dynamics and control; process design and appropriate modern experimental and computing techniques.*

Student Outcomes (SOs)
SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical engineers deal with many aspects of an industrial society, especially those challenges involving chemistry. Chemical engineers engage in a spectrum of manufacturing, design 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, biology, 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 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 integration. The student is also encouraged to explore special interests in other relevant areas through concentration of elective courses towards a minor or the biomolecular concentration.

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, or medicine. 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*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CH 210	Molecular Properties	3	BY 160	Biology II: Cellular & Molecular Biology	3
CH 220	Material Balances	3	CH 260	Thermodynamics & Energy Balances	3
CM 241	Organic Chemistry I	3	CM 242	Organic Chemistry II	3
MA 231	Calculus III	3	MA 232	Differential Equations	3
	Engineering Science Elective[+]	3		Knowledge Area Elective[+]	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CH 320	Phase Equilibria	3	CH 350	Chemical Engineering Lab I	1
CH 330	Transfer Process Fundamentals	3	CH 360	Chemical Reactor Analysis I	3
CM 244	Organic Chemistry Lab	3	CH 370	Transfer Process Design	3

EC 350	Economic Principles & Eng. Economics[++]	3		Math Elective[+]	3
	Technical Elective[+]	3		Engineering Science Elective[+]	3
				Knowledge Area Elective	3
Total		15	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
CH 410	Chemical Engineering Lab II	2	CH 430	Chemical Process Safety	3
CH 420	Process Economics & Conceptual Design	3	CH 460	Process Dynamics & Control	3
ES 499	Professional Experience	0		Engineering Electives[+]	6
	Engineering Elective[+]	3		Undesignated Elective[+]	3
	Knowledge Area Elective	3			
	Undesignated Elective[+]	3			
Total		14	Total		15

*First Year students in chemical engineering may substitute CM103, 104, and 105 for CM 131 and 132. This enables them to take chemistry lab with the first year students majoring in chemistry.

[+] The nine 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, one course 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. Six credits of advanced (200-level or higher) Aerospace Studies or Military Science Courses may be used to satisfy the requirement for the undesignated electives.

[++]Satisfies the Knowledge Area "Economics and Organizations" requirement

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 Biomedical Engineering, Biomolecular Engineering, Chemistry, Environmental Engineering, Environmental Health

& Safety, Materials Engineering, Mathematics, Physics, Quality Based Project Management, or Sustainable Energy Systems. 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 CH490 Transport Phenomena, 3 credits of CH390 Undergraduate Research Project (or equivalent), and one additional math elective. Math elective suggestions are listed below.

CH 561	Chemical Engineering Analysis
MA 331	Fourier Series and Boundary Value Problems
MA 339	Applied Linear Algebra
MA 363	Mathematical Modeling
MA 377	Numerical Methods
MA 381	Probability
STAT 383	Probability and Statistics

BS In Chemistry

Silvana Andreescu, Program Chair
James Peploski, Director of Freshman Chemistry

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:

1. Develop within the student a solid and comprehensive knowledge base to meet the challenges of professional careers spanning the full range of the chemical sciences.
2. Create an intellectually stimulating and experience rich learning environment, with exposure to open-ended problems frequently encountered in real-world situations, to prepare the student for industry positions, graduate school and professional programs.

3. Support and encourage the development of professional relationships and excellent communication tools and skills.

It is a rigorous degree program and students completing their requirements may receive a degree certified by the American Chemical Society if so desired. At the same time, it has the flexibility to allow students to develop the specialties that best meet their career goals.

The small laboratory learning environment provides regular interaction between students and instructors in the laboratory setting, which offers students research experiences as well as 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 major in chemistry provides an excellent foundation for careers in chemical research & development, forensics, product development, toxicology, environmental health & safety and the health related fields. Pre-health sciences advising programs are available for students interested in medical school or health-care fields. A pre-PT undergraduate concentration is available, preparing students for entry into the Doctor of Physical Therapy degree program. A pre-PA concentration leading to the Masters of Physician Assistant Studies degree program is also available.

Required Courses	
CM 103/ CM 105 *	Structure and Bonding with Lab
CM 104/ CM 106 *	Equilibrium and Dynamics with Lab
CM 121	Freshman Seminar
CM 221/ CM 223	Spectroscopy with Lab
CM 241/ CM 242	Organic Chemistry I and II
CM 244	Organic Chemistry Lab
CM 300	Instrumental Lab
CM 312	Inorganic Chemistry
CM 320	Separations and Electrochemistry

CM 345	Advanced Lab
CM 371/ CM 372	Physical Chemistry I and II
PH 131/ PH 132	Physics I and II
MA 131/ MA 132	Calculus I and II
MA 232	Differential Equations
*	**CM131** and **CM132** may be used to satisfy the first year chemistry requirement for the Chemistry BS degree.

Chemistry Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 103	Structure and Bonding	3	CM 104	Equilibrium and Dynamics	3
CM 105	Chemistry Lab I	2	CM 106	Chemistry Lab II	2
MA 131	Calculus I	3	MA 132	Calculus II	3
EV 100	Intro to Environmental Sci & Sustainability	1	PH 131	Physics I	4
UNIV 190	Clarkson Seminar	3	CM 121	Freshmen Seminar	1
FY 100	First-Year Seminar	1		KA Elective	3
Total		13	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 221	Spectroscopy	3	CM 242	Organic Chemistry II	3
CM 223	Spectroscopy Lab	3	CM 244	Organic Chemistry Lab	3
CM 241	Organic Chemistry I	3		KA/UC Elective	3

MA 232	Differential Equations	3	PH132	Physics II	4
	KA/UC Electives	3		Statistics Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CM 345	Advanced Laboratory	4	CM 300	Instrumental Laboratory	3
CM 371	Physical Chemistry I	3	CM 312	Survey of Inorganic Chemistry	3
CM 320	Separations and Electrochemistry	3	CM 372	Physical Chemistry II	3
	Professional Experience	3		KA/UC Elective	3
	Free Elective	3		Biology Courses	3
Total		16	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	KA/UC Elective	3		Free Electives	14
	Free Electives	12			
Total		15	Total		14
Thesis Option					
Seventh **Semester**		**Credits**	Eighth **Semester**		**Credits**
CM 491	Undergraduate Thesis	6	CM 492	Undergraduate Thesis	6
	KA/UC Elective	3		Free Electives	8
	Free Electives	6			
Total		12	Total		14

*Students entering with AP credit or the addition of a minor or a 2nd major will make alternative course choices to meet their needs, therefore the curriculum shown is only an example. The curriculum will be discussed with the student's advisor before courses are selected for each semester.

Those students wishing to satisfy the requirements for an American Chemical Society (ACS) certified BS degree will need at least six credit hours in advanced chemistry electives, including Biochem I, and at least one credit hour of an elective chemistry laboratory course. Directed research can count for only three such credits.

BS In Computer Science
Alexis Maciel, 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 arts 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 below. The first five semesters of the sample schedule shown below are common to all options of the CS major.

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

1. Demonstrate a solid understanding of the core concepts of computer science and some advanced topics in computer science;
2. Reason clearly and analytically about software and computing systems;
3. Work effectively with a variety of programming languages, software tools, and computing environments;
4. Solve substantial real-world problems;
5. Communicate effectively orally and in writing;
6. Work effectively in teams; and
7. 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:

Required Courses	
CS 141*	Introduction to Computer Science I (4 credits)
CS 142*	Introduction to Computer Science II (3 credits)
CS 241*	Computer Organization (3 credits)
CS 242*	Advanced Programming Concepts in Java (3 credits)
CS 341	Programming Languages (3 credits)
CS 344	Algorithms and Data Structures (3 credits)
CS 345	Automate Theory and Formal Languages (3 credits)
CS 350	Software Design & Developments (3 credits)
CS 444	Operating Systems (3 credits)
CS 499	Professional Experience (0 credits)
MA 131	Calculus I (3 credits)
MA 132	Calculus II (3 credits)
MA 211	Discrete Mathematics and Proof (3 credits)
MA 339 OR MA 239	Applied Linear Algebra (3 credits) Elementary Linear Algebra (3 credits)
STAT 383 OR MA 381	Probability and Statistics (3 credits) Probability (3 credits)
Science Electives	One 2-course lecture/ lab sequence in CM or PH, plus 4 additional credits in CM, PH, or BY (12 credits)
CS Electives I	Three advanced CS courses** (9 credits)
CS Electives II	Two advanced courses in CS or related disciplines** (6 credits)

*Or equivalent
**Chosen from a list maintained by the department.

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.

Computer Science Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CS 141	Intro to Comp Sci I	4	CS 142	Intro to Comp Sci II	3
MA 131	Calculus I	3	MA 132	Calculus II	3
	Science Sequence Course I	4		Science Sequence Course II	4
UNIV 190	The Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CS 242	Advanced Programming Concepts	3	CS 241	Computer Organization	3
CS 341	Programming Languages	3	CS 344	Algorithms and Data Structures	3
MA 211	Discrete Math and Proof	3	CS 350	Software Design and Development	3
	Science Elective	4	MA 339	Applied Linear Algebra	3
	Knowledge Area Course	3		Knowledge Area Course	3
Total		16	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CS 345	Automata Theory	3	CS 444	Operating Systems	3
	CS Elective	3		CS Elective	3

STAT 383	Probability and Statistics	3		Knowledge Area Course	3
	Knowledge Area Course	3		Free Elective	3
	Free Elective	3		Free Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	CS Electives	3		CS Electives	6
	Free Electives	12		Free Electives	9
CS 499	Professional Experience	0			
Total		15	Total		15

BS In Civil Engineering
Steven Wojtkiewicz, Program Chair

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 have always 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 people to become successful professionals through quality undergraduate, graduate, and professional continuing education 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 people 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).

Program Educational Objectives (PEOs)
The Program Educational Objectives support the mission of the Civil and Environmental Engineering Department, which is to educate talented and motivated people to become successful professionals through quality undergraduate, graduate, and professional continuing education programs that place a high priority on student access and interaction with faculty.

PEO1: Graduates will become civil engineering professionals who apply knowledge to meet the challenges of their field.

PEO2: Graduates will become civil engineering professionals who exhibit effective communication, teamwork, and leadership.

PEO3: Graduates will become well-rounded citizens who utilize their education to serve the public good, with an understanding of their professional and ethical responsibilities.

PEO4: Graduates will become civil engineering professionals who exhibit intellectual growth, continued innovation, and a commitment to lifelong learning.

Student Outcomes (SOs) to Ensure Achievement of PEOs
SO1a: Students will have the ability to identify, formulate, and solve complex engineering problems through application of the principles of mathematics (including differential equations), calculus-based physics, chemistry, geospatial representation, applied statistics, and principles of civil engineering. (ABET CRITERION3, outcome 1) (addresses PEO1)

SO1b: Students will be experienced in, and have the ability to develop and conduct appropriate experimentation, including laboratory experimentation, to measure multiple phenomena, analyze and interpret data, and use engineering judgment to draw conclusions. (ABET CRITERION 3, outcome 6) (addresses PEO1)

SO1c: Students will have the ability to apply engineering design to produce solutions that meet specified needs for the public good[1]. (ABET CRITERION 3, outcome 2) (addresses PEO1)

SO1d: Students will have the ability to apply learning strategies and modern engineering tools, to identify, formulate, and design solutions for complex engineering problems. (ABET CRITERION 3, outcome 7) (addresses PEO1)

SO1e: Students will have basic proficiency in at least four of the recognized civil focus areas. (Specific program criteria, IMPLIED IN ABET CRITERION 3, outcomes 1, 2, and 6. Addresses in part ABET Criterion 5(c)) (addresses PEO1)

SO1f: Students will have an ability to think creatively, consider risks, make trade-offs, and use informed judgment for the public good while functioning as an individual or on a team to solve complex engineering problems and produce engineering designs. (ABET CRITERION 3, outcomes 1, 4, 5, 7, and IMPLIED IN ABET CRITERION 3, outcomes 2 and 6.) (addresses PEO1)

SO2a: Students will have the ability to organize effective and concise engineering reports and memos for a range of audiences (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2b: Students will have the ability to organize and deliver engineering work in formal oral presentations to a range of audiences. (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2c: Students will have the ability to function effectively on diverse, multi-disciplinary teams, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives towards engineering design solutions that meet specified needs with consideration of the public good. (ABET CRITERION 3, outcomes 3 and 5) (addresses PEO2)

SO3a: Students will have the ability to recognize and practice ethical, professional, and environmental responsibility in engineering problem solving, evaluation, and design based upon knowledge of the humanities and exposure to, and understanding of, environmental quality as well as the NSPE Code of Ethics for Professional Engineers. (ABET CRITERION 3, outcomes 1, 2, and 4) (addresses PEO3)

SO3b: Students will have the ability to understand the impact of engineering solutions on and make informed judgments that consider the public good. (ABET CRITERION 3, outcomes 2, and 4) (addresses PEO3)

SO4a: Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (ABET CRITERION 3, outcome 7) (addresses PEO4)
[1] "The public good": In the practice of engineering consideration of public health, safety, and welfare, as well as global, national, cultural, social, environmental, and economic factors.

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 maximizes 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 transportation, or can use the elective portion of the curriculum to concentrate in selected areas such as construction engineering (including infrastructure and architectural engineering tracks), structural engineering, water resources engineering, or environmental engineering.

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					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CE 212	Introduction to Engineering Design	3	CE 305	Construction Planning and Management	3
CE 301	Introduction to Geospatial Analysis and Geographic Information Systems	3	ES 222	Strength of Materials	3
ES 220	Statics	3	ES 330	Fluid Mechanics	3

MA 231	Calculus III	3	MA 232	Elementary Differential Equations	3
	KA/ UC Elective	3		ES Elective[1]	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CE 320	Structural Analysis with Lab	3	CE 310	Geotech. Engineering I: Soil Mechanics with Lab	3
CE 330	Water Resources Engineering I with Lab	3	CE 340	Intro to Environmental Engineering	3
STAT 383	Probability and Statistics	3	CE 441 CE 442	Reinforced Concrete Design Steel Design	3/3
	KA/ UC Elective	3		ES Elective[1]	3
	Science Elective[2]	3		Professional Elective[3]	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EC 350	Economic Principles and Engineering Economics	3	CE 490/ CE 491	Senior Design	3
	Professional Electives[3]	9		KA/ UC Elective	3
ES 499	Professional Experience	0		Professional Electives[3]	9
	ES Elective[1]	3			

Total	15	Total	15

[1]Eligible ES Electives are: ES 223 Rigid Body Dynamics, ES 250 Electrical Science, ES 260 Materials Science and Engineering I, ES 340 Thermodynamics.
[2]Science Elective: Any 3-credit or greater BY course, CE 315 Geology for Engineers, CE 316 Earth's Dynamic Climate: Science & Impacts, CE 317 Geologic Hazards or per approved CEE science elective list.
[3]A total of 16.5 design credits are required to be accumulated. Required courses provide 12.5 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 3.5 and permission of their advisor, department chair, and the dean of Engineering.

Professional Concentrations in Civil Engineering

Construction Engineering Management

Four required courses including:	
CE 411	Construction Materials Engineering
CE 415/ 515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
Choose at least one of the following non-CE courses:	
COMM 217	Introduction to Public Speaking
EHS 330	Occupational Safety and Ergonomics
EM/OM 380	Project Management

EM/OM 451	Quality Management and Lean Enterprise
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
LW 466	The Law of the Workplace
Completion of at least one of these two tracks:	
1. Construction/ Infrastructure Track:	
Choose at least two of the following:	
CE 302	Surveying, Geodetic Control, and Engineering Measurements
CE 304	Introduction to Scheduling and Estimating
CE 315	Geology for Engineers
CE 404	Applications in Scheduling and Estimating
CE 406	Infrastructure Construction
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 410/510	Sustainable Infrastructure and Building
CE 453/553	Properties and Performance of Concrete Materials
CE 461	Transportation Systems Design
2. Architectural Engineering & Building Construction Track	
Choose at least two of the following:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating

CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 409	Fundamentals of Building Systems
CE 410/510	Sustainable Infrastructure and Building
CE 448	Introduction to Architectural Engineering
CE 509	Advanced Building Science

Structural Engineering

Five required courses including:	
CE 420/520	Computational Methods of Structural Analysis
CE 415/515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
CE 490/491	Senior Design with Structures Focus or approved alternate
Choose at least two of the following:	
CE 408	Building Information Modeling (BIM) and Integrated Project Delivery (IPD)
CE 411	Construction Materials Engineering
CE 448	Introduction to Architectural Engineering
CE 452/552	Advanced Strength of Materials
CE 453/553	Properties & Performance of Concrete Materials
CE 501	Fracture Mechanics of Concrete Structures
CE 512	Structural Dynamics

CE 538	Finite Element Methods
CE 541	Bridge Engineering
CE 549	Experimental Methods in Structures
CE 555	Structural Damage Assessment, Rehabilitation, and Repair

Water Resources Engineering

Four required courses including:	
CE 430	Water Resources Engineering II
CE 470	River Restoration
CE 479	Water and Wastewater Treatment Design
CE 490/ 491	Senior Design with Water Resources Focus or approved alternate
Choose any two from the following:	
CE 315	Geology for Engineers
CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering
CE 434	Sustainable Development Engineering
CE 435	Groundwater Hydrology and Geochemistry
CE 478	Solid Waste Management and Landfill Design
CE 481/581	Hazardous Waste Management and Engineering
CE 482/582	Environmental Systems Analysis and Design
And choose at least one from the following:	
BY/CE/EV 313	Biogeochemical Earth Systems Science
BY/EV 330	Great Lakes Water Protection
BY 431	Limnology
CE 316	Earth's Dynamic Climate: Science & Impacts

CE 317	Geologic Hazards
ES 436	Global Climate Change: Science, Engineering & Policy
COMM 428	Environmental Communication
EV 305	Sustainability & the Environment
POL 374	Environmental Political Theory
POL 375	Environmental Law
POL 470	Environmental Policy

Civil Engineering majors may also sign up for minors in Architectural and Facilities Engineering and/or Environmental Engineering.

The standard length of BS in Civil Engineering is four years or eight semesters.

BS In Computer Engineering
Paul McGrath, Program Chair

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.

Program Educational Objectives (PEOs)
PEO1: Graduates of the Computer Engineering program are expected to have advanced their careers as contributing professionals who apply hardware and software knowledge strengthened with analytical problem-solving skills in a wide variety of practical applications.

PEO2: Graduates of the Computer Engineering program 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.

PEO3: Graduates of the Computer Engineering program 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.

PEO4: Graduates of the Computer Engineering program are expected to have exhibited intellectual growth and pursue continual innovation in computing systems. Those graduates who are extraordinarily talented and motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

Student Outcomes (SOs)
To prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

We expect that within a few years after completing the program our Graduates will become:

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.

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.

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.

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:

1. A coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment
2. Education in the humanities, social sciences, ethical principles and management, with special attention to the development of effective written and oral communication skills
3. The elective coursework in several of the major sub-disciplines of electrical, computer and software engineering encourages the pursuit of individual interests and provides an opportunity to gain further knowledge in these sub-disciplines
4. 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:

1. In the required courses, students are expected to master the fundamentals of hardware design. Hardware design principles are introduced in courses that treat 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 logic circuits, programmable logic devices and embedded systems. Elements common to hardware and software are stressed and hardware/software tradeoff are addressed in this segment of the curriculum

2. Sound software engineering principles are introduced and reinforced with required courses that treat object-oriented design, data structures, standardized components and system software. Students gain experience working in modern software development environments and using modern design tools. In the required course sequence, students learn C/C++, Python and Java in the context of modern integrated development environments, gain experience in embedded and FPGA system design and industry-standard simulation, synthesis, debugging and verification tools in their design projects.
3. Students develop their teamwork and communication skills. They do so in part through coursework that requires them to communicate effectively in written form and in part through coursework 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 sizes, collaborating with others on teams whose composition is determined by their instructors. By participating in team-based problem solving of this kind, with individuals they did not choose as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills
4. 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 a digital system's hardware and software components. 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.
5. 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.

Computer Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 250	Electrical Science	3	EE 211	ECE Lab I	3
EE 262	Intro to Digital Design	3	MA 211	Discrete Mathematics & Proof	3
ES 264	Intro to Object Oriented Programming and Software Design	3	EE 260	Embedded Systems	3
MA 232	Differential Equations	3	EE 321	Systems and Signal Processing	3
	KA/ UC Elective	3	MA 231	Calculus III	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	KA/UC Elective (EC)	3	EE 316	Computer Engineering Junior Lab	3
EE 341	Microelectronics	3	EE 466	Computer Architecture	3
EE 363	Software Components and Generic Programming	3		KA/UC Elective	3
EE 365	Advanced Digital Circuit Design	3		Professional Elective[3]	3

STAT 383	Probability and Statistics	3	EE361	Fundamentals of Software Engineering	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EE 416	Computer Engineering Senior Lab or Professional Elective[3]	3	EE 416	Professional Electives[3] or Computer Engineering Senior Lab	3
	ES or Science Elective	3		Professional Elective	3
	CS Elective[2]	3		Free Electives[4]	6
ES 499	Professional Experience	0		EE/CS[2]/MA[2] Elective	3
	KA/ UC Elective[1]	3			
Total		15	Total		15

*Computer Engineering students must select CS 141 from the available list of Second Semester Science/CS elective courses numbered CM 132/ BY 160/ CS 141.
[1]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, EC 350 is recommended, and one must be ES 110.
[2]The Computer Science Elective must be selected from computer science courses numbered 300 or higher or CS 242. *Math Electives should be listed in the section on Minor in Mathematics.*
[3]The Professional Electives are ECE courses numbering 300 or higher, or other engineering courses if approved by the ECE Department.
[4]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.
[5]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 sub-disciplines, with each sub-discipline including a combination of required and elective courses at the undergraduate level. Note that a number of these courses cross sub-discipline boundaries. Examples of the specializations are shown in the table below. A complete description of currently available courses is available online on the ECE intranet webpage.

Biomedical Engineering	
BR 400	Introduction to Biomedical Rehabilitation Engineering and Science
EE 465	Computer Graphics
EE 466	Computer Architecture
EE 468	Database Systems
EE 485	Neural Engineering
Communication Systems and Signal Processing	
EE 401	Digital Signal Processing
EE 404	Wireless Networks
EE 407	Computer Networks
EE 427	Introduction to Digital Image Processing
EE 470	Coding and Information Transmission
EE 471	Principles of Digital Data Communications
Control Systems	
EE 450	Control Systems
EE 451	Digital Control
EE 452	Optimization Techniques in Engineering

Electronics and Circuits	
EE 441	Electronic Devices
EE 442	CMOS IC Design
Computer Engineering	
EE 368	Software Engineering
EE 407	Computer Networks
EE 408	Software Design for Visual Environments
EE 410	Computer and Network Security
EE 461	Many-Core Architecture and Programming Model
Power Engineering	
EE 333	Power System Engineering
EE 430	High-Voltage Techniques and Measurements
EE 431	Power Distribution and Utilization
EE 438	Alternate Energy Systems
EE 439	Dielectrics

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 the 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 the permission of their advisor, department chair, and the dean of Engineering

BS In Data Science

Program Chair, TBD

Across business, industry, government, and nearly all scientific efforts, the explosion of data and data collection drives a growing need to manage, analyze, and extract insight and knowledge from the data produced. Not only must scientists and engineers grapple with Political Science vast volumes of data, but throughout business and industry, from entry-level technician to executive, the ability to reason effectively using data continues to grow in importance. The skillset required to excel in that environment lies at the

intersection of mathematics, statistics, and computational science. The emerging discipline of *Data Science* addresses that interdisciplinary space, and the National Academy of Science, Engineering, and Medicine (NASEM) has identified this discipline as a critical enabler for tackling many real-world problems.

The BS in Data Science provides students the opportunity to develop an interdisciplinary, data-focused skillset and then apply those skills to real-world challenges. The program provides strong preparation in critical aspects of working with data by thorough grounding in mathematics and statistics and the foundations of computer science as related to data and data processing. The program provides an early focus on foundational competencies across the spectrum of the science of data. Once that baseline is established, students are expected to apply those skills in specific domains of interest to them, with a significant component of the curriculum based on team projects and experiential learning.

The data science curriculum prepares students to:

1. Apply analytic thinking and quantitative reasoning skills to relevant problems;
2. Demonstrate the ability to communicate technical results with clarity and precision;
3. Understand a number of computer programming constructs and develop the ability to quickly assimilate the skills required to use new and emerging programming languages;
4. Solve real-world, open-ended problems;
5. Explore at least one area of application-specific domain knowledge;
6. Work effectively both individually and in teams;
7. Understand the ethical implications of data-driven methods in the modern, data-enabled society

In addition to the major in Data Science, the Mathematics Department offers separate majors in:

1. Mathematics, with more emphasis on abstract mathematics and proof, including coursework that helps students to prepare for graduate study in math or statistics.
2. Applied Mathematics and Statistics, which provides a broader range of courses applicable to many business, engineering, and industrial math applications.

A student may not major in both Data Science and either Applied Mathematics and Statistics or Mathematics.

The courses from these other majors are available to the Data Science major. Interested students can leverage these other offerings to prepare themselves across the full spectrum of opportunities in the mathematical sciences.

Required Courses
Mathematics and Statistics* (35 credits)
Data Science (DS 241, DS 392) (6 credits)
Computer Science (CS 141, CS 142, CS 344, CS 449) (13 credits)
Science** (BY, CM or PH) (8 credits)
Information Systems (IS 314, IS 415, IS 426) (9 credits)
First-Year Seminar (FY 100) (1 credit)
The Clarkson Seminar (UNIV 190) (3 credits)
Knowledge Area/ University Courses (15 credits)
Application Electives*** (6 credits)
Free Electives**** (24 credits)

*Required courses are: MA 131, MA 132, MA 200, MA 211, MA 231, MA 339, MA 499, and STAT 381, STAT 382, STAT 383, STAT 384, STAT 385, STAT 488 (2 credits).

**Science requirements must include at least two courses with labs

***Application Electives are courses from outside the MA, STAT, CS, and IS course designations that provide depth of knowledge in some domain. Students must take two 3-credit courses at the 200 level or higher, both from the same subject area, with the particular pairing approved by the Mathematics Department.

****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 Mathematics Department for details.

Data Science Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CS 141	Intro to Comp Sci I	4	CS 142	Intro to Comp Sci II	3
MA 131	Calculus I	3	MA 132	Calculus II	3

UNIV 190	Clarkson Seminar	3	MA 200	Math Modelling and Software	3
FY 100	First-Year Seminar	1		Knowledge Area Course	3
	Science Elective	4		Science Elective	4
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
DS 241	Intro to Data Science	3	CS 344	Algorithm and Data Structure	3
IS 314	Database Design and Management	3	IS 415	Data Warehousing for Analytics	3
MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
STAT 383	Probability and Statistics	3	MA 339	Applied Linear Algebra	3
	Knowledge Area Course	3		Knowledge Area Course	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CS 449	Computational Learning	3	DS 392	Ethics of Data Analytics	3
IS 426	Big Data Architecture	3	STAT 382	Mathematical Statistics*	3
STAT 381	Probability	3		Knowledge Area/ University Courses	3
	Knowledge Area/ University Course	3		Free Electives	6
	Free Elective	3			
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**

MA 499	Professional Experience	0	STAT 384	Advanced Applied Statistics	3
STAT 385	Bayesian Data Analysis	3	STAT 488	Statistics Projects	2
	Application Elective	3		Application Electives	3
	Free Electives	9		Free Electives	6
Total		15	Total		14

*STAT 382 and STAT 384 are offered alternating years; third and fourth year students take whichever course is offered during that particular semester.

BS In Electrical Engineering
Paul McGrath, Program Chair

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.

Program Educational Objectives (PEOs)
PEO1: Electrical engineering graduates are expected to apply fundamental electrical engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

PEO2: Electrical engineering graduates are expected to become well-rounded citizens who rely on their electrical engineering education to serve society with an understanding of their professional and ethical responsibilities.

PEO3: Electrical engineering graduates are expected to contribute their Electrical Engineering expertise effectively as members of engineering teams in diverse environments through communications, teamwork, and leadership.

PEO4: Electrical engineering graduates are expected to continuously engage in professional development, to exhibit intellectual growth, and to pursue life-long learning through educational endeavors and participation in professional societies and organizations.

Student Outcomes (SOs)
To prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

We expect that within a few years after completing the program, our graduates will become:

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.

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.

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.

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:

1. A coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment
2. Education in the humanities, social sciences, ethical principles and management, with special attention given to the development of effective written and oral communication skills
3. The elective coursework in several of the major subdisciplines of electrical and computer engineering encourages the pursuit of individual interests and provides an opportunity to gain further knowledge in these subdisciplines
4. Experiences that facilitate the development of problem solving, teamwork, and engineering design skills with the aid of modern analysis and design tools
5. 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 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 a depth of knowledge in the discipline that is built upon mastery of the 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:

1. In the 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 their 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.

2. Students gain experience in using state-of-the-art software and engineering tools. They encounter C/C++ programming, MATLAB, PSpice, FPGA and embedded system design 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 coursework 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 sizes. By participating in team-based problem solving of this kind, with individuals they may not have chosen as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills.
3. 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.
4. 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 before 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*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
EE 262	Intro to Object Oriented Programming and Software Design	3	EE 211	ECE Lab I	3
EE 264	Intro to Digital Design	3	EE 321	Systems and Signal Processing	3
ES 250	Electrical Science	3	EE 260	Embedded Systems	3
MA 232	Differential Equations	3	EE 324	Dynamical Systems	3
	KA/ UC Elective[1]	3	MA 231	Calculus III	3
Total		15	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EE 311	EE Junior Lab	3	EE 381	Electromagnetic Fields and Waves	3
	KA/UC Elective (EC)	3		Area elective[2]	3
EE 331	Energy Conversion	3		Math Elective[3]	3
EE 341	Microelectronics	3		ES or Science Elective[4]	3
STAT 383	Probability and Statistics	3		KA/ UC Elective	3
Total		15	Total		15

Seventh Semester		Credits	Eighth Semester		Credits
EE 412	EE Senior Design/ Area Elective	3	EE 412	Senior Design/ Area Elective	3
ES 499	Professional Experience	0		Area Elective	3
	ES Elective	3		KA/ UC Elective	3
	KA/ UC Elective EE[6]/MA[3]/ES[4] Elective	3		Free-electives	6
	Area Electives	6			
Total		15	Total		15

*Electrical Engineering students must select CS 141 from the available list of Second Semester Science/ CS elective courses numbered CM 132/ BY 160/ CS 141.
[1] 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, EC 350 is recommended and one should be ES 110.
[2] There are five 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.
[3] The Mathematics Elective may be MA 211 or numbered 300 level or higher and must include a significant amount of mathematical theory.
[4] The Engineering Science Electives are satisfied by ES courses approved by the ECE Department.
[5]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.
[6]EE Elective numbered 300 level or higher

See Academic Requirements for details of the Clarkson Common Experience, including the First-Year Seminar, The Clarkson Seminar, Knowledge Area (KA) courses, University Courses (US), Professional Experience, and related requirements.

Professional Specializations

The courses offered by the Department of Electrical and Computer Engineering can be grouped into sub-disciplines, with each sub-discipline including a combination of required and elective courses at the undergraduate level. Examples of these specializations are shown in the table below. A complete description of currently available courses can be found online on the ECE intranet webpage. Undergraduate students enrolled in 500-level courses must have a cumulative grade-point average of at least 3.0, and the 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 the permission of their advisor, department chair, and the Dean of Engineering. See Professional Concentrations in Engineering.

Biomedical Engineering	
BR 400	Introduction to Biomedical Rehabilitation Engineering and Science
EE 465	Computer Graphics
EE 466	Computer Architecture
EE 468	Database Systems
EE 485	Neural Engineering
Communication Systems and Signal Processing	
EE 401	Digital Signal Processing
EE 407	Computer Networks
EE 470	Coding and Information Transmission
EE 471	Principles of Digital Data Communications
Control Systems	
EE 450	Control Systems
EE 451	Digital Control
EE 452	Optimization Techniques in Engineering
Electronics and Circuits	
EE 441	Electronic Devices
EE 442	CMOS IC Design

Computer Engineering	
EE 361	Fundamentals of Software Engineering
EE 363	Software Components and Generic Programming
EE 365	Advanced Digital Circuit Design
EE 368	Software Engineering
EE 407	Computer Networks
EE 408	Software Design for Visual Environments
EE 410	Computer and Network Security
EE 461	Many-Core Architecture and Programming Model
Power Engineering	
EE 333	Power System Engineering
EE 430	High-Voltage Techniques and Measurements
EE 431	Power Distribution and Utilization
EE 438	Alternate Energy Systems
EE 439	Dielectrics

BS In Environmental Engineering

Steven Wojtkiewicz, Program Chair

Environmental engineers provide the knowledge, leadership, and guidance needed to improve the quality and ensure 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 people to become successful professionals through quality undergraduate, graduate and professional continuing education 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 maximizes the development of design skills.

Program Educational Objectives (PEOs)
The Program Educational Objectives support the mission of the Civil and Environmental Engineering Department which is to educate talented and motivated people to become successful professionals through quality undergraduate and graduate and professional continuing education programs that place a high priority on student access and interaction with faculty.

PEO1: Graduates will become environmental engineering professionals who apply knowledge to meet the challenges of their field.

PEO2: Graduates will become environmental engineering professionals who exhibit effective communication, teamwork, and leadership.

PEO3: Graduates will become well-rounded citizens who utilize their education to serve the public good, with an understanding of their professional and ethical responsibilities. [1]

PEO4: Graduates will become environmental engineering professionals who exhibit intellectual growth, continued innovation, and a commitment to lifelong learning.

Student Outcomes (SOs) to Ensure Achievement of PEOs
SO1a: Students will have the ability to apply knowledge of mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth science, biological science, and fluid mechanics, formulate material and energy balances, and analyze the fate and transport of substances in and between air, water, and soil phases (ABET CRITERION3, outcome 1) (addresses PEO1)

SO1b: Students will be experienced in, and have the ability to develop and conduct appropriate experimentation, including laboratory experimentation, to measure multiple phenomena, analyze and interpret data, and use engineering judgment to draw conclusions. (ABET CRITERION 3, outcome 6) (addresses PEO1)

SO1c: Students will have the ability to apply engineering design to produce solutions that meet specified needs for the public good[1]. (ABET CRITERION 3, outcome 2) (addresses PEO1)

SO1d: Students will have the ability to apply learning strategies and modern engineering tools, to identify, formulate, and design solutions for complex engineering problems. (ABET CRITERION 3, outcome 7) (addresses PEO1)

SO1e: Students will have basic proficiency in more than one environmental engineering focus area (e.g., air, water, land, or environmental health). (Specific program criteria, IMPLIED IN ABET CRITERION 3, outcomes 1, 2, and 6; Addresses in part ABET Criterion 5(c)) (addresses PEO1)

SO1f: Students will have an ability to think creatively, consider risks, make trade-offs, and use informed judgment for the public good while functioning as an individual or on a team to solve complex engineering problems and produce engineering designs. (ABET CRITERION 3, outcomes 1, 4, 5, 7, and IMPLIED IN ABET CRITERION 3, outcomes 2 and 6.) (addresses PEO1)

SO2a: Students will have the ability to organize effective and concise engineering reports and memos for a range of audiences (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2b: Students will have the ability to organize and deliver engineering work in formal oral presentations to a range of audiences. (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2c: Students will have the ability to function effectively on diverse, multi-disciplinary teams, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives towards engineering design solutions that meet specified needs with consideration of the public good. (ABET CRITERION 3, outcomes 3 and 5) (addresses PEO2)

SO3a: Students will have the ability to recognize and practice ethical, professional, and environmental responsibility in engineering problem solving, evaluation, and design based upon knowledge of the humanities and exposure to, and understanding of, environmental quality as well as the NSPE Code of Ethics for Professional Engineers. (ABET CRITERION 3, outcomes 1, 2, and 4) (addresses PEO3)

SO3b: Students will have the ability to understand the impact of engineering solutions on and make informed judgments that consider the public good. (ABET CRITERION 3, outcomes 2, and 4) (addresses PEO3)

SO4a: Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (ABET CRITERION 3, outcome 7) (addresses PEO4)

[1] "The public good": In the practice of engineering consideration of public health, safety, and welfare, as well as global, national, cultural, social, environmental, and economic factors.

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. The Environmental Engineering curriculum provides for six professional electives. These elective 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 maximizes 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					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CH 210	Molecular Properties	3	CE 340	Introduction to Environmental Engineering	3
CE 212	Introduction to Engineering Design	3	CE 380	Fundamentals of Environmental Engineering with Lab	3
ES 220	Statics	3	ES 330	Fluid Mechanics	3

MA 231	Calculus III	3	MA 232	Elementary Differential Equations	3
	KA/ UC Elective	3		KA/ UC Elective	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CE 330	Water Resources Engineering I with Lab	3	BY 320	Microbiology	3
CE487	Environmental Engineering Laboratory	3	CE 301	Introduction to Geospatial Analysis and Geographic Information Systems	3
CE 479	Water & Wastewater Treatment Design	3	ES 340	Thermodynamics	3
STAT 383	Probability and Statistics	3		Core Professional Course[2]	3
	Earth Science Elective[1]	3		KA/ UC Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EC 350	Economic Principles and Engineering Economics	3	CE 491	Senior Design	3
	Core Professional Course[2]	3		Core Professional Course[2]	3
	Professional Electives[3]	9		Professional Electives[3]	9
Total		15	Total		15

[1]Earth Science Elective must be one of these: CE 315 Geology for Engineers, CE 316 Earth's Dynamic Climate: Science & Impacts, CE 317 Geologic Hazards, CE 477 Atmospheric Chemistry, ES 436 Global Climate Change: Science, Engineering and Policy, BY/EV 312 Adirondack Ecology and Environmental Science, BY/CE/EV 313 Biogeochemical Earth Systems Science

[2]Core Professional Courses must include three of these courses: CE 433/533 Human Exposure Analysis, CE 434/534 Sustainable Development Engineering, CE 481/581 Hazardous Waste Management Engineering, CE 482/582 Environmental Systems Analysis and Design, CE 486/586 Industrial Ecology, ES 432 Risk Analysis, ES436 Global Climate Change: Science, Engineering & Policy.
[3]A total of 16.5 design credits are required to be accumulated. Required courses provide 10.5 design credits.

BS In Mathematics
Guangming Yao, 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 curriculum is designed so that students learn to:
1. Research clearly, logically, and analytically
2. Demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics
3. Work effectively with standard mathematical software packages and write mathematical programs using a high level computer language
4. Apply mathematical knowledge to solve real-world, open ended problems
5. Read mathematical texts and literature and write mathematical proofs
6. Communicate effectively, both orally and in writing
7. 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.

In addition to the major in Mathematics, the Mathematics Department offers separate majors in:

1. Applied Mathematics and Statistics, which provides a broader range of courses applicable to many business, engineering, and industrial math applications.
2. Data Science, which combines courses from mathematics, statistics, and computational science to help students develop the interdisciplinary, data-driven skillset needed to tackle real-world problems involving reasoning from vast volumes of data.

A student may not major in both Mathematics and either Applied Mathematics and Statistics or Data Science.

Required Courses
Mathematics and Statistics* (44 credits)
Computer Science (CS 141) (4 credits)
Physics (PH 131, and PH 132) (8 credits)
Science (BY, CM, or PH) (3 credits)
First-Year Seminar (FY 100) (1 credit)
The Clarkson Seminar (UNIV 190) (3 credits)
Knowledge Area/ University Courses (15 credits)
Free Electives** (42 credits)

*Required courses are: MA131, MA132, MA200, MA211, MA231, MA232, MA321, MA339, MA499, and STAT383, plus either MA451 or MA453. A student must also complete either the Math Option, which requires two of MA_311, MA 312, MA_313, MA_314, and MA_322, or the Statistics Option, which requires STAT_381, STAT_382, STAT_384, and STAT_488

** 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 the curriculum for the Mathematics major with the Math Option; with the Statistics Option some courses in the last four semesters will be different than shown here

Mathematics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
MA 131	Calculus I	3	MA 132	Calculus	3
PH 131	Physics I	4	PH 132	Physics II	4
CS 141	Computer Science I	4	MA 200	Math Modelling & Software	3
UNIV 190	The Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
MA 232	Differential Equations	3	MA 339	Applied Linear Algebra	3
	Science Elective	3	STAT 383	Probability and Statistics	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Free Elective	3		Free Elective	3
Total		15	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
MA 311/ MA 313	Abstract Algebra/ Abstract Linear Algebra	3	MA 322/ MA 312/ MA 314	Advanced Calculus II/ Number Theory	3

MA 321	Advanced Calculus I	3	MA 451/ MA 453	Intro To Math Research/ Intro to Math Instruction	2
	Knowledge Area/ University Course	3		MA/ STAT Elective	3
	Free Elective	3		Knowledge Area/ University Course	3
	Free Elective	3		Free Elective	3
Total		15	Total		14
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
MA 499	Professional Experience	0		MA/ STAT Elective	3
	MA/ STAT Elective	3		Free Electives	12
	Free Electives	12			
Total		15	Total		15

BS In Mechanical Engineering
Maricas Martinez, Program Chair

Program Educational Objectives (PEOs)
The educational objectives for the ME program are to produce graduates who:

PEO1: competently apply engineering methods to solve professional problems associated with the design, development, manufacture, and maintenance of mechanical systems and understand the social, ethical, and environmental context of their work.

PEO2: communicate clearly with diverse and international communities, collaborate competently in cross-functional teams, and assume leadership roles while meeting the expectations of their employers.

PEO3: habitually engage in professional development.

Student Outcomes (SOs)
In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

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 mechanical systems.

Curriculum Overview
The 120-credit program contains 84 credit hours of required technical courses, 36 credit hours of electives (including four 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 at least four distinct knowledge areas. Communication intensive course requirements 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 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. Up to two 400-level Aerospace Studies or Military Science courses may be used as professional electives. 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. Aerospace Studies or Military Science courses (200-level or higher) may be used as undesignated electives.

Mechanical Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
First Semester		**Credits**	**Second Semester**		**Credits**
MS/ AS	Military Science/ Aerospace Studies (if elected)	1	MS/ AS	Military Science/ Aerospace Studies (if elected)	1

Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 220	Statics	3	ES 222	Strength of Materials	3
ES 250	Electrical Science	3	ES 223	Rigid Body Dynamics	3
ES 260	Materials Science	3	ME 212	Into. To Engineering Design	3
MA 232	Elem. Differ Equations	3	ME 201	Mech. Engineer Lab I	1
	KA/ UC Elective	3	MA 231	Calculus III	3
				KA Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
ES 330	Fluid Mechanics	3	ME 310/ ME 455	Thermodynamics Sys. Eng Mechanical Vibration and Control	3
ES 340	Thermodynamics	3	ME 326	Intermediate Fluid Mechanics	3
MA 330*	Adv. Engineer. Math*	3	ME 341	Mech. Of Machine Elements	3
ME 301	Mech. Engineer. Lab II	1	ME 401	Mech. Engineer. Lab III	1
ME 342	Intro. Numerical Methods	3	ME 445	Integrated Design I	3
	KA/ UC Elective	3		Professional 1 Elective	3
Total		16	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
ME 411	Intro. to Heat Transfer	3		Professional Elective	3
ME 446	Integrated Design II	3		Professional Elective	3

ME 324	Dynamical Systems	3		Economic Elective	3
	Professional Elective	3		Undesignated Elective	3
	Undesignated Elective	3	ES 499	Professional Experience	
Total		15	Total		12

*Students can alternatively take MA 331 and (STAT 383 or STAT 389)

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:

1. Present the fundamental knowledge needed for professional work in industry or graduate school, while including many free electives
2. Offer a flexible curriculum to satisfy diverse career objectives and make it possible to double major in Physics and other fields
3. 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. Student research frequently leads to publication in internationally recognized scientific journals. The typical length of the Physics BS is eight semesters (four years).

The physics major requires a total of 35 credits of physics courses and must meet the University requirements for graduation with a Bachelor's degree.

Requirements for BS in Physics

Required Courses
First-Year Seminar (1 credit)
The Clarkson Seminar (3 credits)
Physics* (35 credits)

Mathematics** (18 credits)
Chemistry (8 credits)
Biology Elective (3 credits)
Knowledge Area and University Course Electives (15 credits)
Programming intensive course (3 credits)***
Technology Elective (3 credits)
Free Electives**** (31 credits)

*For students considering attending graduate school in physics a total of 45 credits in physics is recommended including PH 435, two additional 300 level PH elective courses and one additional 400 level elective course.

The 35 credits of physics courses, include:
1. Core Courses: PH 121, PH 131, PH 132, PH 221, PH 231, PH 232, PH 325, PH 327, PH 331, and PH 380. Students adding the physics major after their first semester may replace PH 121 (First Year Seminar) with PH 435 (Senior Seminar). 100/200 level PH elective courses (i.e. courses outside PH 121, PH 131, PH 132, PH 221, PH 231, and PH 232) do not count towards the major in physics.

2. One 3-credit 300 level PH elective course. Teaching methods in physics, directed study, directed research and senior thesis courses do not count towards this requirement.

3. One 3-credit 400 level PH elective course. Teaching methods in physics, directed study, directed research and senior thesis courses do not count towards this requirement.

4. One credit from any of the following professional experience courses PH 445 (Senior Thesis), PH 478 (Directed Research Experimental), PH 479 (Directed Research Theoretical) or PH 480 (Internship/Co-Op). PH 463 (Computer Simulation Methods in Physics, 3 credits, 2 communication points) also counts towards meeting the Professional Experience requirement in Physics.

** 18 credits of Mathematics include MA 131, MA 132, MA 231, and MA 232 plus any two 300 level or higher math courses.

***A minimum of two credits from a programming intensive course (CS 141 recommended, but also ES 100, MA 200, PH 320, PH 463. Honors students may count HP 102 or HP 103 towards this requirement). Where a PH course is used to satisfy the

requirement it does not count towards the 35 credits of physics required for the physics major.

****Free electives should include C1/C2 courses to meet the minimum 6 Communication points requirement. PH 435 is included in Free Electives.

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

Physics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
PH 131	Physics I	4	PH 132	Physics II	4
MA 131	Calculus I	3	MA132	Calculus II	3
CM 131	Chemistry I	4	CM 132	Chemistry II	4
PH 121	Physics Freshman Seminar	1		Free Elective (recommended PH157)	3
UNIV190	The Clarkson Seminar	3			
FY 100	First-Year Seminar	1			
Total		16	Total		14
Third Semester		**Credits**	**Fourth Semester**		**Credits**
PH 231	Modern Physics	3	PH 221	Theoretical Mechanics	3
PH 232	Modern Physics Lab	1	MA231	Calculus III	3
MA 232	Differential Equations	3		Free Elective (C1)	3
	Biology Elective (Recommended BY 110)	3		KA Elective	3

	KA Elective	3		Free Elective	3
	Programming Elective	3			
Total		16	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
PH 325	Thermal Physics	3		Free Elective	3
PH 380	Electromagnetic Theory	3	PH 331	Quantum Physics I	3
MA 381	Probability	3	MA 331	Fourier Series and Boundary Value Problems	3
	Free Elective	3	PH327	Experimental Phys I	3
	KA Elective	3		Free Elective (C2)	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
PH435	Senior Seminar	1		400 Level PH Elective	3
	300 Level PH Elective	3		Technology Elective	3
	Univ Elective	3		Free Elective (3 courses)	9
	Free or Bio Elective	3			
	Free Elective	1			
	PH Elective/Prof Exp.	3			
Total		14	Total		15

Minors and Concentrations in Engineering

Minor in Architectural and Facilities Engineering

Architectural engineering, also known as building engineering, is an engineering discipline that deals with the technological aspects and multi-disciplinary approach to planning, design, construction, and operation of buildings, such as analysis and integrated design of indoor environmental systems (energy conservation, HVAC, plumbing, lighting, fire protection, acoustics, vertical and horizontal transportation), structural systems, behavior and properties of building components and materials, and construction management. Facilities engineering carries this forward into the operations, maintenance, renovation, upgrade, commissioning, and other aspects of how buildings function throughout their lifecycle. The practice of architectural and facilities engineering is a practice that also involves mechanical, electrical, environmental, and other engineering disciplines as well as building science, energy management, architecture, construction management, and other allied fields. The architectural, engineering, and construction industry is seeking people from a variety of majors in engineering to perform within the space of Architectural and Facilities Engineering.

Required courses	
CE 305	Construction Planning and Management
CE 408	Building Information Modeling & Integrated Project Delivery
CE 409	Fundamentals of Building Systems
CE 448	Introduction to Architectural Engineering
Choose two out of the following elective courses:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating
CE 410/510	Sustainable Infrastructure and Building
CE 411	Construction Materials Engineering
CE 415/515	Dynamical Systems
CE 441	Reinforced Concrete Design
CE 442	Steel Design
EE 321	Systems and Signal Processing

EE 331	Energy Conversion
EE 333	Power System Engineering
EE/ME 450	Control Systems
EHS 330	Occupational Safety and Ergonomics
ES 238	Introduction to Energy Systems
EV 305	Sustainability & the Environment
ME 310	Thermodynamic System Engineering
ME 411	Introduction to Heat Transfer
ME 444	Computer Aided Engineering
Choose one out of four of the elective courses:	
DS 241	Introduction to Data Science
MA 330	Advanced Engineering Mathematics
STAT 383	Probability and Statistics
STAT 389	Probability and Statistics with Multivariate Analysis
Choose 1 course in art history, architectural history, art appreciation, applied art, or related study (as a knowledge area/university course), 3 credit hours.	
Choose one out of the four elective courses:	
EM/OM 380	Project Management
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
Students must also complete a capstone experience (CE490/491, ME446, EE412, EM456, or equivalent) with an Architectural and/or Facilities focus. Students are also encouraged to seek out alternative multidisciplinary/interdisciplinary capstone options (inclusive of courses related to Clarkson Ignite President's Challenge) to satisfy this requirement.	

Note: these lists are inclusive of their subsequent course formulations, if modified. Courses not listed must be approved by the CEE Department.

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, while they graduate with a traditional engineering degree. This minor is connected closely with the minor in Biomedical Science and Technology. Students from both minors participate in shared core courses. Students can take only one (not both) of the two minors.

A foundation knowledge of Calculus I & II (MA131/132), Differential Equations (MA232), Physics I & II (PH131/132), and Biology II: Cell and Molecular Biology (BY160) is required for this minor.

Physiology/ Anatomy Requirement (select one of the following 2 options)	
BY 471/ BY 473	Anatomy and Physiology I Anatomy and Physiology I Lab
BY 472/ BY 474	Anatomy and Physiology II Anatomy and Physiology II Lab *Recommended option–Permission of instructor will be given if you do not have the prerequisite BY471/BY473.*
BR 200	Introduction to Biomedical and Rehabilitation Engineering, Science and Technology
BR 400	Biomedical Engineering Fundamentals
Choose 2 from the approved list of upper division biomedical engineering and science related courses, at least one from engineering (ME, EE, CH, ES, BR).	

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 non-engineering 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.

Students can take only one (not both) of the two minors.

A foundation knowledge of Biology II: Cell and Molecular Biology (BY 160) is required for this minor.

Biology Fundamentals requirement (select one of the following 2 options)	
BY 471/ BY 473	Anatomy and Physiology I Anatomy and Physiology I Lab
BY 472/ BY 474	Anatomy and Physiology II Anatomy and Physiology II Lab *Recommended option–Permission of instructor will be given if you do not have the prerequisite BY471/BY473.*
BR 200	Introduction to Biomedical and Rehabilitation Engineering, Science, and Technology
Choose 3 from an approved list of upper division biomedical related courses.	

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.

Required courses:	
CM 103	Structure and Bonding
CM 104	Chemical Equilibrium and Dynamics
CM 105	Chemistry Laboratory I
CM 106/ CM 131 and CM 132	Chemistry Laboratory II General Chemistry I and General Chemistry II
Choose five of the following courses, including at least one of the labs:	
CM 221	Spectroscopy
CM 223	Spectroscopy Lab
CM 241	Organic Chemistry I
CM 242	Organic Chemistry II

CM 244	Organic Chemistry Lab
CM 300	Instrumental Lab
CM 312	Survey of Inorganic Chemistry
CM 320	Separations and Electrochemistry
CM 345	Advanced Lab
CM 371	Physical Chemistry I
CM 372	Physical Chemistry II
CM 460	Biochemistry I
CM 461	Biochemistry II
CM 470	Biochemistry/ Biotechnology Lab

Minor in Cognitive Neuroscience

Required basic science courses:	
BY 140	Biology I: Inheritance, Evolution and Diversity
BY 142	Biology I Laboratory
BY 160	Biology II Cellular and Molecular Biology
BY 162	Biology II Laboratory
CM 131	General Chemistry I
CM 132	General Chemistry II
PH 141	Physics for Life Sciences I
PH 142	Physics for Life Sciences II
PY 151	Introduction to Psychology
Required Cognitive Neuroscience Courses	
BY/ PY 458	Cognitive Neuroscience
BY/ PY 454	Biological Psychology

BY/ PY 460	Neurobiology
Choose two Psychology Elective Courses from the following:	
BY/ PY 357	Human Cognitive Evolution
BY/ PY 358	Animal Learning and Cognition
PY 317	Psychology of Psychoactive Drugs
PY 359	Perception
PY 360	Learning and Memory
PY 462	Abnormal Psychology
PY 463	Health Psychology
Choose two Biology Elective Courses from the following:	
BY 214	Genetics
BY 310	Developmental Biology
BY 350	Comparative Anatomy
BY 360	Physiology
BY 471	Anatomy and Physiology I
BY 472	Anatomy and Physiology II
BY 480	Advanced Cell Biology

[1]CM 103/ 105 and CM 104/ 106 will also satisfy the Chemistry requirement
[2]PH 131 and PH 132 will also satisfy the Physics requirement
[3]Biology majors taking the cognitive neuroscience minor cannot use PY/ BY 454 as one of their Biology elective courses

Minor in Computational Science
The minor in Computational Science is available to students in any major. The minor allows students to develop an expertise in Computational Science while pursuing a conventional major, which provides the context wherein they apply their computational skills. To complete the minor the student must achieve a grade-point average of at least 2.00 in courses totaling at least 21 credits, distributed as follows:

Required course:	
MA 377	Numerical Methods

Choose two of the following courses	
MA 232	Elementary Differential Equations
MA 239/ MA 339	Elementary Linear Algebra/ Applied Linear Algebra
STAT 282/ STAT 383	General Statistics/ Probability and Statistics
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.

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

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

Required courses:	
CS 141	Introduction to Computer Science I
CS 142	Introduction to Computer Science II
CS 344	Algorithms and Data Structures
MA 211	Discrete Mathematics and Proof
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.

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 four elective courses from the following list:

Required courses	
EE 331	Energy Conversion
EE 381	Electromagnetic Fields and Waves
ES 250	Electrical Science
EE 264	Introduction to Digital Design
Choose two out of four of the elective courses:	
EE 321	Systems and Signal Processing
EE 324	Dynamical Systems
EE 341	Microelectronics
EE 333	Power System Engineering

Courses not on this list must be approved by the ECE Department.

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:

1. Satisfy prerequisites (MA 131, MA 132, PH 131, PH 132, MA 232, CM 131 or equivalents) for the three core ES courses – ES 220, ES 250, ES 260.
2. Complete the three core ES courses- ES 220, ES 250, ES 260
3. 1 scientific programming course (minimum two credit hours ES 100 or equivalent)
4. 3 engineering electives (minimum nine credit hours – any ES, ME, AE, CE, CH EE courses for which the candidate has the prerequisites, except ES 100, ES110, ES 238, BR 200)

This minor is 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 Environmental Engineering. To obtain a minor, a student must successfully earn 18-20 credit hours by completing the following required courses:

Core required courses (2):
One of the following courses:

CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering
CH 220	Material Balances
One of the following courses:	
Capstone Design with specific environmental focus (e.g., CE 490/491, MP 401, AE 451, CH 420, EE 412, EM 456, ME 446)	
Environmentally-related research (e.g., CE 495, CE496, ES 443/5/6/7)	
One of the following chemical principles courses:	
CE 487	Environmental Engineering Laboratory
CH 210	Molecular Properties
CM 221	Spectroscopy
CM 241	Organic Chemistry I
CM 371	Physical Chemistry I
One of the following biological principles courses:	
BY 214	Genetics
BY 222 and 224	Ecology and Ecology Laboratory
BY 320	Microbiology
BY 330/EV 330	Great Lakes Water Protection
Two of the following courses*: Note: at least ONE course must be a core professional elective	
Core Professional Electives (minimum ONE required):	
ES 432 or CE433	Risk Analysis Human Exposure Analysis
ES 436	Global Climate Change: Science, Engineering & Policy
CE 434	Sustainable Development Engineering

CE 479	Water and Wastewater Treatment Design
CE 481	Hazardous Waste Management Engineering
CE 482	Environmental Systems Analysis Design
CE 486	Industrial Ecology
Other Professional Electives:	
BY 314	Bioinformatics
BY 328	Conservation Biology
BY 412	Molecular Biology Laboratory
BY 425	Biological Systems and Environmental Change
BY 431 & BY 432	Limnology & Limnology Laboratory
BY 486	Molecular Biotechnology
CE 430	Water Resources Engineering II
CE 435	Groundwater Hydrology & Geochemistry
CE 477	Atmospheric Chemistry
CE 478	Solid Waste Management and Landfill Design
EHS 406	Industrial Hygiene Control Methods
EHS 416	Principles of Toxicology and Epidemiology
EV 314	Adirondack Integrated Research Project

*Substitutions made upon approval of the department chair

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 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: CS 141 or EE 261, and CS 142 or EE 361
2. One course in computer systems: CS 241 or EE 360

3. One course in database administration IS 314*
4. One course in computer networks EE 407 or CS 455
5. Two courses concerned with Web Technologies and administration COMM 442 and COMM 444

*For School of Business Majors for whom IS 314 is not a required course, IS 211 may be used to fulfill this requirement.

Minor in Mathematics

The Minor in Mathematics is open to all students except those majoring in Mathematics, Applied Mathematics and Statistics, Data Science, or Mathematical Economics. To complete the minor the student must achieve at least a grade-point average of at least 2.00 in seven three-credit courses from the following list:

Choose seven from the following courses:	
MA 131	Calculus I
MA 132	Calculus II
MA 200	Introduction to Mathematical Modeling and Software
MA 211	Discrete Mathematics and Proof
MA 230	3-D Space and Projective Geometry
MA 231	Calculus III
MA 232	Elementary Differential Equations
MA 239	Elementary Linear Algebra
MA 241	Introduction to Data Science
MA 277	Elementary Numerical Methods
	Any Clarkson University 3 credit MA or STAT course at the 300-level of above

Any CS course which is double-listed as an MA course at the 300-level or above also counts toward the minor; check with the Mathematics Department for details.

Minor in Manufacturing Engineering

The minor in Manufacturing Engineering provides students the opportunity to expand their knowledge of manufacturing-related topics such as production management, statistical quality control, and manufacturing processes. The objectives of this minor

are to provide students with exposure to the engineering, economics, and business methods relevant to advanced manufacturing and prepare them to apply these methods to solve professional problems in manufacturing. Students seeking the minor must complete 4 required courses and 3 elective courses, as listed below, for a minimum of 21 credit hours. The elective courses listed comprise a representative list of elective courses approved for the minor. This list will be updated periodically by the Manufacturing Engineering Committee, and the full list will be maintained by the Department of Mechanical and Aerospace Engineering.

Core Required Courses (4):	
Course Number	Title
ES 260	Materials Science and Engineering I
ME 390	Advanced Manufacturing Processes
OM/EM 331	Operations and Supply Chain Management
EC 350	Economic Principles of Engineering Economics
Choose 3 out of the following elective courses	
OM/EM 451	Quality Management and Lean Enterprise
CE 481	Hazardous Waste Management Engineering
CE 486	Industrial Ecology
CH 430	Chemical Process Safety
CH 460	Process Dynamics and Control
EE 264	Introduction to Digital Design
EE 331	Energy Conversion
EE 450	Control Systems
EE 455	Robotics I
EE 456	Robotics II
ME 385	Design of Electromechanical Systems
ME 405	Geometric Dimensioning and Tolerancing
ME 443	Optimal Engineering
ME 444	Computer Aided Design

AE 457	Composites Mechanics and Design
ME 492	Welding Metallurgy
AE 459	Space Robotics

Minor in Materials Engineering

Many engineers and scientists are employed in the materials processing and manufacturing industries and research labs. Current and emerging areas of infrastructure construction, microelectronics fabrication, polymer processing, biomaterials, and sustainable energy systems, require materials engineering expertise. Clarkson University is offering a Materials Engineering Minor to prepare students for diverse employment opportunities that require knowledge of materials fundamentals and applications. Students seeking the minor must complete 2 required courses and 3 electives from the courses listed below for a minimum of 15 credit hours.

Required courses (2)

ES260 Materials Science and Engineering I
ES360 Materials Science and Engineering II

Electives (3)

Engineering Courses		
Course		***Pre-requisite or co-requisite***
ES222	Strength of Materials	ES220 or permission of the instructor
ES241	Solid-State Materials Systems for Advanced Technologies	PH131, CM103 (or CM131), MA131, and MA132 (corequisite)
ES361	Fine Particle Technology	CM104 (or CM132)
ES452	Biomaterials and Biomedical Applications	Junior or Senior standing
ES464	Corrosion of Metals	CM132 (or CM104) and ES260
MSE451	Advanced Materials Characterization	**CM132 (or CM104 and CM106), PH132, and ES260**
CE411	Construction Materials Engineering	Junior or Senior standing
CE453	Properties and Performance of Concrete	ES260
EE341	Microelectronics	ES250
EE439	Dielectrics	none

EE443	Semiconductor Material and Devices for Engineers	none
AE/ME457	Composite Mechanics and Design	ES222 and ES260
ME390	Advanced Manufacturing Processes	ES260
ME457	Composite Mechanics and Design	ES222 and ES260
ME492	Welding Metallurgy	ES260
Science Courses		
CM221	Spectroscopy	CM104 (or CM132)
CM430	Colloids and Interfaces	none
CM432	Fine Particle Charcaterization	none
CM475	Sustainable Nanotechnology	none
CM481	Computational Chemistry	CM371 and CM372
CM483	Introduction to Polymer Science	Junior standing or permission by instructor
CM485	Nanostructured materials	Senior standing or permission by instructor
PH331	Quantum Physics	PH231 and MA232
PH341	Solid State Physics I	PH231, or ES260, or permission by instructor
PH487	Applications of Synchrotron and Electron Based Techniques	PH132 or consent of the instructor; ES260 and/or PH231 are recommended pre-requisites

*Possible alternative courses include those at the graduate level, such as:

ME506	Mechanical Behavior of Materials	Permission by instructor
ME508	Fracture Mechanics	Permission by instructor

Minor in Physics

A minor in Physics is available to students in any degree program. This option requires 24 credits of PH courses. A minimum 2.0 average must be maintained in these courses and none can be designated pass/no entry. The minor should be initiated by the

beginning of the junior year to allow time to complete the necessary coursework. To obtain a minor, a student must complete the following:

Required courses:	
PH 131	Physics I
PH 132	Physics II
PH 231	Fundamentals of Modern Physics
PH 331	Quantum Physics
Choose one of the following intermediate courses:	
PH 221	Theoretical Mechanics
PH 230	Physics III
Choose one of the following one-credit courses:	
PH 121	Physics Freshman Seminar
PH 232	Modern Physics Laboratory
PH 435	Physics Seminar
PH 470	Directed Study Experimental
PH 474	Directed Study Theoretical

Any two 3-credit Physics or equivalent courses approved by the department at the 300-400 level.

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:

1. (CS 141, CS 142, and CS 344) or (EE 261, EE 361, and EE 363)
2. CS 242 or EE 408
3. EE 368 or CS 350
4. EE 465/ CS 453, CS 455/ EE 407, EE 468/ CS 460, or other course approved by the Software Engineering Program Committee

Minor in Statistics

The minor in Statistics is open to all students except those majoring in Mathematics, Applied Mathematics and Statistics, or Data Science.. To complete the minor the

student must achieve at least a 2.000 grade-point average in courses totaling at least 21 credits, distributed as follows:

1. One calculus course (MA 181 or MA 131 equivalent)
2. One linear algebra course (MA 239 or MA 339 equivalent)
3. One introductory statistics course (STAT 282 or STAT 383 equivalent)
4. 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.

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. This fossil fuel combustion though also generates over three-quarters of the worlds' carbon dioxide emissions and contributes to other air pollutants that are harmful to public health. 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	
ES 238	Introduction to Energy Systems
ES 340/ CH 260	Thermodynamics
AE 451/ CE 490/ CE 491/ CE 492/ CH 482/ CH420/ EE 412/ EM 456/ ME 446/ ES 443 / EE416	Capstone Design (or energy related research) with specific energy focus
One of the following Environmental Impacts Choice Courses:	
CE 486	Industrial Ecology
ES 436	Global Climate Change: Science Engineering and Policy

EV 305	Sustainability and the Environment
One of the following Policy Choice Courses:	
EC 360	Environmental Economics
POL 375	Environmental Law
POL 470	Environmental Policy
POL 471	Energy Policy
PHIL 370	Environmental Ethics
Two of the following Technology Choice Courses (at least one must focus on energy tech):	
CE 409*	Fundamentals of Building Systems
CE 410	Sustainable Infrastructure and Building
CE 486[1]	Industrial Ecology
CH/CM413	Carbon Capture and Sequestration
EE 331*	Energy Conversions
EE 333	Power Systems Engineering
EE 438*	Alternative Energy Systems
ES 436[1]	Global Climate Change: Science, Engineering, and Policy
ES 443*	Energy Technology related research projects
ES459	Electrochemistry for Sustainability
EV 390[2]	Sustainability Project Experience
ME 310*	Thermodynamic System Engineering

*At least one of the two technology choice classes must have this designator
[1]If not taken as an environmental impacts choice
[2]Applicability of this class changes annually

Biomolecular Engineering Professional Concentration
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 must take BY 160 Cellular & Molecular Biology (3 credit hours) and BY 162 Cellular & Molecular Biology Lab (2 credit hours) in spring semester of the sophomore year. BY 160 is a requirement for all chemical engineering students; students pursuing the concentration must also take the BY 162 laboratory course. The required mathematics elective must be a suitable statistics course (STAT 383 Applied Statistics or STAT 318 Biostatistics) and technical and engineering electives are replaced with the required courses CM 460 Biochemistry I and CH 465 Biochemical Engineering. An undesignated elective is replaced with a course selected from the following list of courses relevant to biomolecular engineering: BR 200 Introduction to Biomedical Rehabilitation Engineering and Science, BY 214 Genetics, BY 320 Microbiology, BY 360/ 362 Comparative Physiology with Lab, BY 412 Molecular Biology Laboratory, BY 419 Immunology, BY 471/ 473 Anatomy and Physiology I with lab, BY 485 Neural Engineering, EHS 416 Principles of Toxicology and Epidemiology, ES 380 Biomechanics or ES 452 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 Professional Concentration
A professional concentration in Construction Engineering Management (CEM) 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 sub-discipline of Construction Engineering as defined by the Accreditation Board of Engineering and Technology (ABET). The CEM concentration has two tracks: (1) Construction/Infrastructure track for students planning a career in heavy construction management and (2) Architectural Engineering & Building Construction track for students planning a career in sustainable building design and construction management.

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:

Construction Engineering Management

Four required courses including:	
CE 411	Construction Materials Engineering
CE 415/ 515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
Choose at least one of the following non-CE courses:	
COMM 217	Introduction to Public Speaking
EHS 330	Occupational Safety and Ergonomics
EM/OM 380	Project Management
EM/OM 451	Quality Management and Lean Enterprise
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
LW 466	The Law of the Workplace
Completion of at least one of these two tracks:	
1. Construction/ Infrastructure Track:	
Choose at least two of the following:	
CE 302	Surveying, Geodetic Control, and Engineering Measurements
CE 304	Introduction to Scheduling and Estimating
CE 315	Geology for Engineers

CE 404	Applications in Scheduling and Estimating
CE 406	Infrastructure Construction
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 410/510	Sustainable Infrastructure and Building
CE 453/553	Properties and Performance of Concrete Materials
CE 461	Transportation Systems Design
2. Architectural Engineering & Building Construction Track	
Choose at least two of the following:Five required courses included:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 409	Fundamentals of Building Systems
CE 410/510	Sustainable Infrastructure and Building
CE 448	Introduction to Architectural Engineering
CE 509	Advanced Building Science

Students should meet with their academic advisor to select the most appropriate CEM courses according to their career objectives.

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.

Electrical Power Engineering Professional Concentration
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

Two of the following Power Electives:	
EE 430	High Voltage Techniques and Measurements
EE 439	Dielectrics
EE 450	Control Systems
ES 340	Thermodynamics
EE 438	Alternative Energy Systems
EE 451	Digital Control*
EE 432	Control and Management of Modern Electric Power Distribution
*Any power engineering graduate course with department approval	
One of the following Breadth Electives:	
EE 450	Controls Systems
EE 451	Digital Control
EE 401	Digital Signal Processing
EE 407	Computer Networks
EE 365	Advanced Digital Circuit Design

Courses not on this list 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.

*EE450 and EE451 can only be used as breadth electives if not used as a power elective.

Structural Engineering Concentration
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:

Structural Engineering

Five required courses including:	
CE 420/520	Computational Methods of Structural Analysis
CE 415/515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
CE 490/491	Senior Design with Structures Focus or approved alternate
Choose at least two of the following:	
CE 408	Building Information Modeling(BIM) and Integrated Project Delivery(IPD)
CE 411	Construction Materials Engineering
CE 448	Introduction to Architectural Engineering
CE 452/552	Advanced Strength of Materials
CE 453/553	Properties & Performance of Concrete Materials
CE 501	Fracture Mechanics of Concrete Structures
CE 512	Structural Dynamics
CE 538	Finite Element Methods
CE 541	Bridge Engineering

CE 549	Experimental Methods in Structures
CE 555	Structural Damage Assessment, Rehabilitation, and Repair

It is of particular importance for transfer students to be aware of the sequence of prerequisite courses required to complete Steel Design and Reinforced Concrete Design for the Structural Engineering concentration. This sequence consists of ES220, ES222, CE320, CE441 (Spring), CE442 (Fall), 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.

Water Resources Engineering Concentration

A professional concentration in Water Resources Engineering is available to undergraduate students who are planning a career in hydraulics, open channel flow, water treatment, or hydrology. The professional concentration allows students to satisfy the accreditation requirements in civil engineering while pursuing a course of study in water resources engineering. Students receive a Bachelor of Science degree in CE with a certificate of professional concentration in Water Resources Engineering.

To obtain a Professional Concentration in Water Resources Engineering, a student must choose required and professional electives in order to complete the following seven courses:

Four required courses including:	
CE 430	Water Resources Engineering II
CE 470	River Restoration
CE 479	Water and Wastewater Treatment Design
CE 490/ 491	Senior Design with Water Resources Focus or approved alternate
Choose any two from the following:	
CE 315	Geology for Engineers
CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering

CE 434	Sustainable Development Engineering
CE 435	Groundwater Hydrology and Geochemistry
CE 478	Solid Waste Management and Landfill Design
CE 481/581	Hazardous Waste Management and Engineering
CE 482/582	Environmental Systems Analysis and Design
And choose at least one from the following:	
BY/CE/EV 313	Biogeochemical Earth Systems Science
BY 330/ EV 330	Great Lakes Water Protection
BY 431	Limnology
CE 316	Earth's Dynamic Climate: Science & Impacts
CE 317	Geologic Hazards
ES 436	Global Climate Change: Science, Engineering & Policy
COMM 428	Environmental Communication
EV 305	Sustainability & the Environment
POL 374	Environmental Political Theory
POL 375	Environmental Law
POL 470	Environmental Policy

LEWIS SCHOOL of HEALTH and LIFE SCIENCES

Lenn Johns, Dean

The Earl R. and Barbara D. Lewis School of Health Sciences offers undergraduate degrees in Biology, Healthcare, and Psychology, a minor in Bioethics, and 4 graduate degrees: Doctor of Physical Therapy (DPT), Master of Science in Physician Assistant Studies (MS-PAS), Master of Science in Occupational Therapy (MS-OT), and Master of Science in Bioethics. The school also offers a Freshman Direct Entry Program into the clinical programs.

The Freshman Direct Entry program allows students to apply for acceptance into an undergraduate program of study while simultaneously applying to one of our three clinical graduate healthcare programs (DPT, MS-PAS, MS-OT). When accepted into the Freshman Direct Admit program, students are guaranteed a spot in their selected graduate program as long as they meet that program's prerequisite requirements (see detailed requirement for each program in the graduate program section). The pre-healthcare tracks provide students with additional advising and programming opportunities aimed to inform and prepare them for graduate school and a variety of careers in healthcare.

The clinical programs (DPT, MS-PAS, MS-OT) are designed to prepare students to become highly skilled, entry-level healthcare providers who offer care through a patient centered approach that values interdisciplinary care and evidence based practice. Students and faculty of the programs contribute to the knowledge of their professions through interprofessional scholarship and practice. The clinical programs are located in Clarkson Hall, which houses state of the art facilities and equipment designed to provide a supportive and innovative learning environment. The Bioethics Program provides education, through the Master of Science and advanced certificates, preparing professionals for careers in clinical ethics, research ethics, and bioethics policy.

BS In Biology

Stefanie Kring, 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 in the biosphere: molecules, cells, organ systems, species, and ecosystems. The foundation of the Biology Program is a core curriculum of interactive classroom and laboratory experiences that covers 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 outcomes:

1. Demonstrate proficiency in biology through mastery of the core knowledge of the discipline and specialization in one or more subfields of the life sciences.

2. 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.
3. Develop the ability to think critically and solve problems through exposure to quantitative laboratory- and field-based research, primary research literature, and the history of biological science.
4. Apply appropriate technology, methodology and informational tools that accelerate progress in the workplace such as computer software, bioinformatics, genetic engineering, cell culture, microscopy, etc
5. Master oral and written communication skills essential for work in all fields of biology and the health professions.
6. Develop social skills of interpersonal interaction including an awareness and appreciation of cultural diversity that enhances progress and enriches the pursuit of scientific endeavors
7. Gain strong appreciation of the importance of professional ethical behavior in society and the workplace
8. Convey insight of current issues of bioethical concern ranging from preservation of global biodiversity to the improvement of human health through modern advances in biotechnology
9. 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 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, environmental policy, and environmental health & safety or sustainability.

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.

Required Courses	
BY 140	Biology I: Inheritance, Evolution, and Diversity (3 credits)
BY 142	Biology I Laboratory (2 credits)
BY 160	Biology II: Cellular and Molecular Biology (3 credits)
BY 162	Biology II Laboratory (2 credits)
BY 214	Genetics (3 credits)
BY 401	Professional Assessment (0 credits)
Each of the following additional requirements must be satisfied:	
	Biology Electives (21-23 credits)
	Lab Electives (4-6 credits)
	Math and Computer Science Electives (9 credits) General and Organic Chemistry Electives (116 - 137 credits) Physics Electives (8 credits)
	Professional Experience (0 credits)

Elective Categories:

1. Biology electives are any course under the “BY” subject area
2. Students must take two BY lab courses (200-level or higher), excluding BY 405 and BY 410
3. Three math, statistics, or computer science courses (100-level or higher), including one calculus course and one statistics course
4. Two courses of general chemistry lecture and lab
5. Organic Chemistry I (CM 241)
6. Two courses of physics lecture and lab
7. Professional experience is 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.

Biology Sample Curriculum			
First Semester	**Credits**	**Second Semester**	**Credits**

BY 140	Biology I	3	BY 160	Biology II	3
BY 142	Biology I Lab	2	BY 162	Biology II Lab	2
CM 131	General Chemistry I	4	CM132	General Chemistry II	4
MA 180	Intro to College	4	MA181	Basic Calculus	3
UNIV190	Clarkson Seminar	3		Knowledge Area Elective	3
FY 100	First-Year Seminar	1			
Total		17	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 241	Organic Chemistry I	3	BY 214	Genetics	3
				Free Elective	3
PH 141	Physics for Life Sciences I	4		Biology elective	3
	BY Lab Elective	5	PH 142	Physics for Life Sciences II	4
	Knowledge Area Elective	3	STAT 318	Biostatistics	4
Total		15	Total		17
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	Biology Electives	6			
	Knowledge Area Electives	3		Biology Elective	8
				Technology Course	3
	Free Elective	6		Free Elective	3
Total		15	Total		14

Seventh Semester		Credits	Eighth Semester		Credits
	Biology Elective	5		Biology Elective	6
	Knowledge Area Elective	3		Knowledge Area Elective	3
	Free Elective	6		Free Elective	3
	Professional Experience Elective	1	BY 401	Professional Assessment	0
Total		15	Total		12

BS In Business of Biotechnology
Tom Langen, Program Director

Program Mission
The Business of Biotechnology (BB) BS degree program is an interdisciplinary bioscience and business program that has the mission of preparing students for a successful career in the business of biotechnology. The program is designed to teach the scientific, legal, and regulatory content knowledge needed to understand what biotechnologies are, and how they are developed, commercialized, and produced. It is also designed to teach the content knowledge, applications skills, and applied ethical and economic reasoning required to work as a successful business administrator or leader in biotechnology or a related field.

Program Vision
BB degree holders will become the leaders and entrepreneurs who are instrumental in the development, commercialization, and production of innovative and impactful biotechnology products and services. They will do so while also being models of ethical behaviour and decision-making.

Program Objectives

1. Students are educated in the core concepts and tools of biotechnology and learn how to continuously self-educate to keep up with changes in the commercial biotechnology field.
2. Students learn how different kinds of biotechnology businesses function and learn the content knowledge and skills needed to be employed in the different administrative and managerial roles within biotechnology businesses.
3. Graduates learn to lead a diverse, multi-disciplinary team to success by project management best practices and managing team dynamics.

4. Graduates are educated and prepared to communicate effectively and professionally both orally and in writing.
5. Students learn how to interpret, analyze, and make justified and sound decisions using data.
6. Students learn the legal and regulatory framework around biotechnology R&D and commercialization. They learn the ethical issues around biotechnology and its business applications, and they learn how to make ethical professional decisions.

Program Outcomes

1. Graduates can explain the general concepts and applications of major commercial biotechnologies. They can explain and demonstrate how they keep up with the rapid changes and innovation in the field.
2. Graduates will have the basic science content knowledge to understand the scientific foundations of biotechnology.
3. Graduates can explain and show detailed familiarity with how biotechnology businesses are organized and function, including start-ups and established firms, and including research and development (R&D) or commercialized product and service business.
4. Graduates can explain and demonstrate how to manage a project intended to design a biotechnology product, process or service to meet desired needs within realistic constraints including ethical, health and safety, economic, environmental, social, political, manufacturability, and sustainability.
5. Graduates can explain and demonstrate how to function as a member or lead an effective and diverse multi-disciplinary biotechnology business team.
6. Graduates can assess, analyze, and apply data to make decisions relevant to biotechnology businesses.
7. Graduates can explain and demonstrate how they put into practice professional ethics in the business of biotechnology. They demonstrate an awareness and understanding of the causes and consequences of unethical decisions and practices in the field.
8. Graduates can explain the legal and regulatory framework and constraints on biotechnology R&D and commercialization.
9. Graduates demonstrate effective written and oral professional communication.
10. Graduates are prepared for employment and are hired by biotechnology businesses. They are prepared for and successful in MBA programs.

Degree Requirements

General Clarkson University undergraduate degree requirements
Clarkson University requires that students complete 120 credit hours of coursework with a 2.0 GPA.

All students must complete The Clarkson Seminar (UNIV 190), or equivalent. Students entering Clarkson as First Year students must also complete The First Year Seminar (FY 100). Students must select coursework and possibly extra-curricular activities that carry a total of at least six communications points. Students are also 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. Additionally, at least one of these five courses must be a University Course that has two Knowledge Area designators. Students must take at least one laboratory course, two science courses, two math courses and coursework in statistics, and be introduced to professional ethics in their field. Students must take one course with a technology designation, and complete a professional experience.

The curriculum is designed to make it easy to acquire a minor in *Project Management* or *New Product Development*. Because of the interdisciplinary nature of this major between business and biology, general minors in Business or Biology are not awarded for BB majors.

BB Degree Program requirements overview

Bioscience (15 credits)**:** At least one course in (1) Introductory cell & molecular biology and lab, (2) cell biology, (3) genetics, and (4) microbiology, plus (5) one Biology seminar course.

Biotechnology Science (14-17 credits)**:** At least one course in (1) introductory biotechnology, (2) biotechnology seminar, (3) molecular biology laboratory, (4) advanced biotechnology, (5) bioinformatics, and (6) biotechnology professional experience.

Biotechnology Ethics, Law, Regulations (6-9 credits)**:** At least on course in: (1) law and (2) biotechnology regulations. ***Strongly recommended but not required:*** (3) professional ethics.

Chemistry (11 credits)**:** (1) Two semesters of general chemistry and (2) one semester of biochemistry.

Mathematics and Computer Science (6-10 credits)**:** At least two courses including (1) calculus (including integral calculus) and (2) statistics.

Business (39 credits)**:** At least one course in: (1) organizational behaviour, (2) project management, (3) marketing, (4) finance, (5) quality management, (6) business policy and strategy, (7) management technology, (8) supply chain management, (8) microeconomics, (10) macroeconomics, (11) data analytics, and (12) accounting.

There are four recommended tracks: (1) Project Management, (2) Supply Chain, and (3) Data Analytics, (4) Marketing and & Product Development. Alternately, a student may opt for a (5) Generalist track that combines coursework from each of the three.

Not required but strongly recommended: **Professional Communication** (3 credits): at least one course in public speaking, professional writing, or data visualization and presentation.

Professional Experience (0-3 credits): A BB student must have a professional experience of at least 120 hours of activity in an area related to the business of biotechnology. This includes a co-op, internship or job at a biotechnology or biomedical business, research involving biotechnology, or working as a teaching assistant in a course with business or biotechnology content. The professional experience can be completed as a co-op during an academic year semester or during the summer of any academic year. As a product, the student will write a paper explaining what they did and reflecting on what they learned from the experience, and have a memo submitted by their supervisor affirming that the student had adequately completed their professional experience. To transcript this, students will enrol in either BY498 Internship in Bioscience (0 credits), BY499 Professional Experience in Bioscience (0 credits), or BY405 Research in Bioscience (variable credit). Students will sign up for the section number of the BB Program Director (i.e. Langen, section 42), who will approve and verify that the activity meets the requirements of the professional experience. Note that this is not qualitatively different from the professional experience requirement for the Biology-BS degree.

Biotechnology of Business Curriculum

Bioscience (15 credits)
BY160 Biology II - Cellular and Molecular Biology (3 credits)
BY162 Biology II Laboratory (2 credits)
BY214 Genetics (3 credits)
BY218 Cell Biology (3 credits)
BY300 Biology Seminar (1 credit)
BY320 Microbiology or BY 480 Medical Microbiology (3 credits)

Biotechnology Science (14 credits)
BY120 Introduction to Biotechnology & Applications (3 credits)
BY 200 Business of Biotech Cohort Development (1 credit)
BY 314 Bioinformatics (4 credits)
BY486 Molecular Biotechnology (3 credits)
BY 412 Molecular Biology Laboratory (3 credits)
Professional Experience Course: BY 498 Internship in Bioscience (0 credits), BY499 Professional Experience in Bioscience (0 credits), or BY 405 Research in Bioscience (variable credit)

Biotechnology Ethics, Law, Regulations (6-9 credits)
BY 370 Biotechnology product development and regulatory affairs (3 credits)
LW 270 Law & Society I (3 credits)

***Strongly recommended*:** One professional ethics course, e.g.: HC 201 Bioethics Across the Healthcare Industry (3 credits), PHIL 241 Medical Ethics (3 credits), PHIL 243 Business Ethics (3 credits), POL 380 The Law and Bioethics (3 credits), or other professional ethics course

Chemistry (11 credits)
CM131 General Chemistry (4 credits)
CM132 General Chemistry II (4 credits)
CM305 Biochemistry for Health Sciences (3 credits)

Mathematics (8-11 credits)
MA180 Intro to College Mathematics AND MA182 Basic Calculus (7 credits)
or MA131 Calculus (4 credits)
STAT 318 Biostatistics or STAT 282 Statistics (4 credits)

Business Core (30 credits)
AC205 Introduction to Financial and Managerial Accounting (3 credits)
EC150 Microeconomics (3 credits, EC) and EC 151 Macroeconomics (3 credits, EC) or
EC 350 Engineering Economics + SB 322 Designing and Leading Innovative Ventures
IS110 Introduction to Business Intelligence and Data Analytics (3 credits)
MK320 Principles of Marketing (3 credits)
FN361 Financial Management (3 credits)
OM331 Operations and supply chain management (3 credits)
OM476 Management of Technology (3 credits)
OS286 Organizational Behavior I (3 credits)
OS432 Organizational Policy & Strategy (3 credits)

Business tracks (9 credits)

Project Management
OM/EM 380 Project Management
OM/EM 451 Quality Mgmt. & Lean Enterprise
OS352 Strategic Human Resource Management or OS466 Negotiations and Relationship Management

Supply Chain Management
OM/EM 341 Supply Chain Design and Management (3 credits)
SB/EM 381 Logistics Management (3 credits)
OM/EM 371 Strategic Sourcing (3 credits)

Data Analytics
IS 301 Applied Data Analytics (3 credits)
IS 314 Database Design & Management (3 credits)
EC 311 Introduction to Econometrics or ES405 Design of Experiments & Analysis of Data (3 credits)

Marketing & Product Development
MK321 Consumer Behavior (3 credits)
MK332 Marketing Research (3 credits)
MK436 Creativity, Innovation, New Product Development (3 credits)

Generalist
Any three courses from the advising business tracks, or an alternative business course upon approval of the degree Program Director.

***Strongly recommended*: Professional Communication** (3 credits)
COMM 217 Intro to Public Speaking (3 credits) or COM 313 Professional Communication (3 credits) or another COMM designated course

Other courses (4 credits + variable)
FY100 First Year Seminar (1 credit)
UNIV190 University Course (3 credits)
Free electives (around 20 credits) to reach 120 credits

Business of Biotechnology Sample Curriculum

Fall Year 1		**Credits**
AC205	Introduction to Financial and Managerial Accounting (or IS110)	3
EC 150	Microeconomics	3
FY100	First Year Seminar	1
UNIV190	University Course	3
BY120	Introduction to Biotechnology & Applications	3
MA180	Intro to College Math (or MA131 CalcI)	4
Total		**17**
Spring Year 1		
BY160	Biology II - Cellular and Molecular Biology	3
BY162	Biology II Laboratory	2
IS 110	Introduction to Business Intelligence and Data Analytics (or AC205)	3

EC 151	Macroeconomics	3
MA181	Basic Calculus (or elective)	3
BY 200	Business of Biotech Cohort Development	1
Total		**15**
Fall Year 2		
STAT 282/318	Statistics / Biostatistics	4
BY 218	Cell Biology	3
CM 131	General Chemistry I	4
OS 286	Organizational Behavior I	3
Total		**14**
Spring Year 2		
BY214	Genetics	3
OM 331	Operations and supply chain management	3
LW 270	Law & Society I	3
XXxx	Free elective	3
CM 132	General Chemistry II	4
Total		**16**
Fall Year 3		
BY 486	Molecular Biotechnology	3
BY 314	Bioinformatics	4
MK320	Principles of Marketing	3

FN 361	Financial Management	3
Total		**13**
Spring Year 3		
BY320/448	Microbiology / Medical Microbiology	3
CM 305	Biochemistry for Health Sciences	3
OM 476	Management of Technology	3
BY 370	Biotechnology product development and regulatory affairs	3
XXxx	Professional communication elective (or elective)	3
Total		**15**
Fall Year 4		
BY 412	Molecular Biology Laboratory	3
XXxx	Professional Ethics Elective (or elective)	3
OS 432	Organizational Policy & Strategy	3
XXxx	Business Elective	3
XXxx	Free Elective	3
Total		**15**
Spring Year 4		
BY 405/498/99	Professional Experience	0-3
XXxx	Business Elective	3
XXxx	Free electives	8-11
BY 300	Biology Seminar	1

Total		**15**
Total credit		**120**

BS in Healthcare

David Schelly, Program Director

The Healthcare degree is designed for future clinicians. From medical conditions to evidence-based practice, courses prepare students to begin postgraduate work in a range of healthcare programs, including our own graduate programs in Occupational Therapy, Physical Therapy, and Physician Assistant Studies. The curriculum is steeped in the sciences, including biology courses that provide a foundation for understanding how nature affects human health. On the nurture side, psychology and other social science courses focus on human development, cognition, and social determinants of health. The degree is designed with various clinical career paths in mind, allowing students flexibility to fulfill the prerequisites in their intended fields of study. No matter their clinical ambitions, the Healthcare degree provides students with a strong foundation to work in the healthcare industry.

Students in Healthcare will develop the Core Competencies for Entering Medical Students, endorsed by the Association of American Medical Colleges Group on Students Affairs (GSA) and Committee on Admissions (COA). In addition to soft-skill preprofessional competencies, these include 1) Critical Thinking, 2) Quantitative Reasoning, 3) Scientific Inquiry, 4) Written Communication, 5) Living Systems, and 6) Human Behavior.

	First Year Fall			**First Year Spring**	
Course	Description	Credits	Course	Description	Credits
FY100	First Year Seminar (Required)	1	BY160	Biology II – Cellular & Molecular Biology	3
PY151	Introduction to Psychology (IG)	3		HC Elective (Communications)	3

BY140	Biology I – Inheritance, Evolution, and Diversity	3		Free Elective	3
BY142	Biology I Laboratory	2		Free Elective	3
UNIV190	Clarkson Seminar (Required)	3		Free Elective	3
	Math Course	4			
Total		16	Total		15
	Second Year Fall			**Second Year Spring**	
Course	Description	Credits	Course	Description	Credits
HC207	Medical Anthropology	3	HC205	Medical Conditions	3
BY471	Human Anatomy & Physiology I	3		Science Elective I	3
BY473	Human Anatomy & Physiology I Lab	2		Statistics Course (STAT)	4
	Math Course	3		HC Elective (Ethics)	3
	Free Elective	3		HC Elective (Diversity)	3

	HC Elective (Communications)	1			
Total		15	Total		16
	Third Year Fall			**Third Year Spring**	
Course	Description	Credits	Course	Description	Credits
HC301	Evidence-Based Practice	3	OS286	Organizational Behavior I (IG)	3
	Science Elective II	3	HC307	Rural Healthcare	3
PY/HC370	Developmental Psychology	3		Knowledge Area Elective (C1)	3
	Free Elective	3		Free Elective	3
	Knowledge Area Elective (UNIV)	3		Knowledge Area Elective (C1)	3
Total		15	Total		15
	Fourth Year Fall			**Fourth Year Spring**	
Course	Description	Credits	Course	Description	Credits

PY/HC463	Health Psychology (C1)	3	HC499	Professional Experience	1
	HC Elective (BY)	3		HC Elective (PY)	3
	Knowledge Area Elective	3		HC Elective (HC)	3
	Free Elective	3		Free Elective	3
	Free Elective	3		Free Elective	3
Total		15	Total		13
				Total Credits	120

BS In Healthcare Business

David Schelly, Program Director

The Healthcare Business degree prepares students for careers on the business side of the healthcare industry, from real-world evidence specialists to pharmaceutical sales. While the degree leads seamlessly to our Master of Business Administration in Healthcare Management program, it also provides an impressive foundation for healthcare careers right after graduation, many with high salary ceilings and potential for advancement. The curriculum starts with core business offerings in accounting, organizational behavior, marketing, economic principles, and supply chain management. On the healthcare side, the curriculum includes medical terminology, healthcare communication, rural healthcare, and health behavior. Finally, several core courses are designed to immerse students in the business of healthcare – a field at the forefront of innovation, technology, diagnostics, and patient-centered care. Graduates will understand how clinicians think, and they will have the business acumen to pursue a range of nonclinical healthcare careers.

Students in Healthcare Business will:

1) Understand the core features of the U.S. healthcare system, including patient care settings, the pharmaceutical and medical technology industries, insurance markets, and state and federal funding mechanisms.

2) Apply fundamental business principles from marketing, economics, finance, and organizational studies to real-world healthcare challenges.

3) Learn how data-driven decision making can enhance both patient outcomes and operational efficiency in healthcare organizations.

4) Use evidence-based tactics to locate, evaluate, communicate, and apply scientific literature in regard to various health outcomes.

5) Explore how organizational practices, ethical decision-making, and patient care are informed by healthcare policies, laws, and regulations.

6) Understand the unique characteristics of rural healthcare and their implications for healthcare administration, delivery, and management.

7) Cultivate communication and leadership skills to participate in and manage multidisciplinary teams convened to support patient health and organizational outcomes.

8) Learn about trends and advancements in health information technology and data analytics to drive healthcare delivery, support quality improvement, and ensure patient safety.

	First Year Fall			**First Year Spring**	
Course	Description	Credits	Course	Description	Credits
FY100	First Year Seminar (Required)	1	BY160	Biology II – Cellular & Molecular Biology	3

	Math Course	4	BY162	Biology II Laboratory	2
IS110	Introduction to Financial and Managerial Accounting	3	OS286	Organizational Behavior I (IG)	3
BY140	Biology I – Inheritance, Evolution, Diversity	3		HC Elective (Communications)	3
BY142	Biology I Laboratory	2	PY151	Introduction to Psychology (IG)	3
UNIV190	Clarkson Seminar	3			
Total		16	Total		14
	Second Year Fall			**Second Year Spring**	
Course	Description	Credits	Course	Description	Credits
	Science Elective I	4		Statistics course	3
HC102	Medical Terminology and Communication in Healthcare	2		Science Elective II	3
AC205	Introduction to Financial and Managerial Accounting	3		Knowledge Area Elective	3

	Free Elective	3		HC Elective (Communications)	1
	COMM 2 course	3		HC Elective (Ethics)	3
				HC Elective (Diversity)	3
Total		15	Total		16
	Third Year Fall			**Third Year Spring**	
Course	Description	Credits	Course	Description	Credits
HC301	Evidence-Based Practice	3	HC307	Rural Healthcare	3
HC316	Health Communication	3	EC350	Economic Principles & Engineering Economics	3
MK320	Principles of Marketing	3		HC Elective (PY)	3
HC325	Healthcare Finance	3		HC Elective (BY)	3
OM331	Operations & Supply Chain Management	3		Free Elective	3
Total		15	Total		15

	Fourth Year Fall			**Fourth Year Spring**	
Course	Description	Credits	Course	Description	Credits
HC365	Healthcare Systems and Policy	3	HC405	Health Behavior	3
	HC Elective (SB)	3	HC465	Healthcare Quality and Improvement	3
	Knowledge Area Elective/UC	3		Knowledge Area Elective	3
	COMM 1 course	3		Free Elective	3
	Free Elective	3	HC499	Professional Experience	2
Total		15	Total		14
				Total Credits	120

BS in Psychology

Lisa Legault, Chair

Psychology is the study of mind, brain, 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 directed research opportunities, 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:

1. Be able to critically evaluate information and apply it to a problem or question.
2. Be able to apply psychological principles to real-world problems.
3. Have content expertise in the areas of psychology represented by the psychology faculty.
4. Be able to write clearly and effectively.

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

Required Mathematics Courses	
Three (3) college level math courses to include at least one calculus course and one statistics course.	
Required Psychology Courses	
PY 151	Introduction to Psychology
PY 253	Social Psychology
PY 255	Cognitive Psychology
PY 456	Research Methods in Psychology
PY 457	Data Analysis in Psychology
PY 496	Directed Research
PY400-403	Internship (one course from this group)
Choose one of the following physiological requirements	
PY 454	Biological Psychology
PY 458	Cognitive Neuroscience

PY 460	Neurobiology
PY 359	Perception
Choose one of the following cognitive requirements	
PY 357	Human Cognitive Evolution
PY 358	Animal Learning and Cognition
PY 360	Learning and Memory
PY 461	Judgment and Decision Making
Choose one of the following health and well-being requirements	
PY 372	Community Psychology
PY 462	Abnormal Psychology
PY 463	Health Psychology
PY 464	Clinical Psychology
Choose one of the following social and cultural requirements	
PY 355	Personality Psychology
PY 361	Motivation and Emotion
PY 366	Cultural Psychology
PY 453	Advanced Topics in Social Psychology
Choose three of the following Psychology courses (or from unchosen requirement courses above)*	
PY 246	Educational Psychology
PY 268	Diversity Science
PY 286	Organizational Behavior I
PY 310	Human Sexuality
PY 311	Cyberpsychology
PY 315	Personal Relationships

PY 317	Psychology of Psychoactive Drugs
PY 319	Current Readings in Animal Behavior
PY 321	Consumer Behavior
PY 340	Behavioral Ecology and Sociobiology
PY 363	Judgment and Decision Making for the Biomedical Sciences
PY 370	Developmental Psychology
PY 411	Counseling Psychology
PY 412	Psychiatric Center Professional Experience
PY 360	Learning and Memory
PY 459	Neuroscience Society
PY 480	Directed Study in Psychology.
PY 481	Directed Study in Social Psychology
PY 482	Directed Study in Physiological Psychology
PY 483	Directed Study in Cognitive Psychology
PY 491	Directed Research in Health Psychology
PY 492	Directed Research and Psychophysiology
PY 493	Directed Research in Cognitive Psychology
PY 494	Directed Research in Social Psychology
PY 495	Directed Research in Clinical Psychology
PY 498-499	Senior Thesis

*This list of courses was current when the Catalog was published. Contact the Department of Psychology for updated information.

The Professional and Professional Experience and Information Technology requirements are distributed throughout the Psychology Curriculum. PY 456 satisfies the Technology Serving Humanity requirement.

Psychology Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
PY 151	Intro to Psychology	3	PY 253	Social Psychology	3
FY 100	First-Year Seminar	1	PY 255	Cognitive Psychology	3
UNIV 190	The Clarkson Seminar	3		Mathematics Course	3
	Mathematics Course	3		Science Course	3
	Science Course	5		Science Course Lab	2
Total		15	Total		14
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	Cognitive Elective	3	STAT 318	Biostatistics	3
	Psychology Electives	6		Psychology Electives	3
	KA/UC Electives	3		KA/UC Elective	3
	Free Electives	3		Free Electives	6
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
PY 456/457	Research Methods and Data Analysis	6		Physiological Elective	3
	KA/UC Elective	3		Technology Elective	3
	Social and Cultural Elective	3		KA/UC Elective	3
	Free Electives	5		Free Electives	6

Total		17	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	Directed Research/ Internship	3		Health and Well-Being Elective	3
	KA/UC Elective	3		Free Electives	12
	Free Electives	9			
Total		15	Total		15

Minors and Concentrations in Lewis School

Minor in Cognitive Neuroscience
Cognitive neuroscience is the study of the physiological and biochemical mechanisms underlying higher-order human cognitive processes, such as attention, memory, perception and emotion.

Students interested in pursuing a career in the clinical health sciences (medicine, physical therapy, clinical psychology, neuropsychology) might be particularly interested in the cognitive neuroscience minor, offered by the Psychology Department.

Required Courses
PY151 Introduction to Psychology
BY140 Biology I: Inheritance, Evolution and Diversity
BY142 Biology I Laboratory (2 credits)
BY160 Biology II: Cellular and Molecular Biology
BY162 Biology II Laboratory (2 credits)
CM131 General Chemistry I (4 credits)
CM132 General Chemistry II (4 credits)
PH141 Physics for Life Sciences I (4 credits)
PH142 Physics for Life Sciences II (4 credits)

BY/PY458 Cognitive Neuroscience
BY/PY454 Physiological Psychology
BY/PY460 Neurobiology

Two from
PY317 Psychology of Psychoactive Drugs
BY/PY358 Animal Learning and Cognition
PY/BY357 Human Cognitive Evolution

BY/PY359 Perception
PY360 Learning and Memory
PY462 Abnormal Psychology
PY463 Health Psychology

Two From
BY360 Physiology
BY480 Advanced Cell Biology
BY214 Genetics
BY310 Developmental Biology
BY350 Comparative Anatomy
BY471 Anatomy and Physiology I
BY472 Anatomy and Physiology II

Minor in Medicine and Healthcare
A minor in Medicine and Healthcare is available to students in all degree programs. To obtain a minor, students must complete 25 credits:

Required courses	
BY 160	Biology II - Cellular and Molecular Biology
BY 162	Biology II Laboratory
BY 471	Anatomy and Physiology
PY 151	Introduction to Psychology
HS 220	Medicine and Healthcare Profession Seminar
HS 405	Experiential Learning in Healthcare
Choose one the following Biomedical Science and Engineering Elective courses	
BY 416/ EHS 415	Principles of Toxicology and Epidemiology
BY 380	Techniques in Immunological Research
BY 419	Immunology
BY 440	Introduction to Biomedical Rehabilitation Engineering and Science
BY 448	Medical Microbiology
BY 452	Pharmacology

BY 472	Anatomy and Physiology II
BY 473	Anatomy and Physiology I Lab
BY 474	Anatomy and Physiology II Lab
BY 476	Current Topics in Biology and Medicine
BY 480	Advanced Cell Biology
BY 485	Neural Engineering
BY 488	Stem Cells and Regenerative Medicine
BR 200	Intro to Biomedical and Rehabilitation Engineering
CM 305/CM 460	Biochemistry for Health Science or Biochemistry I
Choose one of the following Health Psychology and Social Sciences Elective courses	
ANTH 238	Men and Masculinities
HS 200	Health Coaches I
HS 210	Health Coaches II
PY 268	Diversity Science
PY 372	Community Psychology
PY 461/PY 363	Judgement and Decision Making or Judgement and Decision Making for the Biomedical Sciences
PY 462	Abnormal Psychology
PY 463	Health Psychology
SOC 320	Medical Sociology
SOC 330	Health, Wealth, Inequality and the Environment
SS 221	Introduction to Sexuality
Choose one of the following Medical Humanities courses	

HIST 230	Science and Society
HIST 270	Introduction to Society, Culture and Biology
HIST 338	Women, Gender and Science in American History
HIST 331	Ancient Medicine and Magic
HIST 333	Science, Technology and Society in the Renaissance
HIST 321	History of Public Health in America
HIST 459	Neuroscience and Society
HIST 335	History of Medicine in Europe and North America
Choose one of the following Medical Ethics courses	
BIE 400	Responsible Conduct of Research
BIE 410	Biomedical Ethics
PHIL 241	Medical Ethics
POL 380	The Law and Bioethics

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: PY 151 (Introduction to Psychology) and any 5 Psychology courses (1) that are numbered 200 or above and (2) are each worth 3 or more credit hours. Only one of which can be one of the directed research or internship courses.

Professional Concentration in Health Psychology
The Professional Concentration in Health Psychology is aimed at Psychology majors interested in careers in health science. The Professional Concentration in Health Psychology can be obtained by completing any 6 of the courses listed below (18-21 credits). Note that 3 of these courses must be used as undesignated free elective courses and cannot be used for the Psychology major.

Choose three from the following courses	
PY 253	Social Psychology
PY 310	Human Sexuality

PY 317	The Psychology of Psychoactive Drugs
PY 360	Learning and Memory
PY 361	Motivation and Emotion
PY 412	Psychiatric Center Professional Experience
PY 454	Biological Psychology
PY 458	Cognitive Neuroscience
PY 462	Abnormal Psychology
PY 463	Health Psychology

Minor in Bioethics

A minor in Bioethics is available to all students in all degree programs. To obtain the Bioethics minor students must complete 18 credit hours of required and elective courses and an experiential learning activity through coursework, internships, or volunteering. Students select one of two tracks, Healthcare and Humanities or Science and Engineering. There are two required courses for both tracks, BIE 400 and 410, for 6 credit hours. Students must complete 12 more credit hours of electives; 6 credit hours must come from the approved STEM and Health Professions list for the relevant minor track, 3 credit hours must come from Humanities and Social Sciences division A, and 3 from Humanities and Social Sciences division B. The Bioethics Department will maintain a list of electives students may take to satisfy the minor requirements. The Bioethics minor is intended to be flexible and adaptive to changes in Clarkson's course offerings to ensure that students may complete the minor alongside their major requirements.

Minor in Biology

A minor in Biology is available to students who take at least 19 credit hours in Biology. 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:

Choose one of the following	
BY 214	Genetics
BY 222	Ecology
BY 320	Microbiology
BY 360	Comparative Physiology

BY 471	Human Anatomy and Physiology I
BY 472	Human Anatomy and Physiology II
Students must also take at least 9 credits of Biology courses numbered 300 or above.	
Students must choose one of the following laboratory courses	
BY 142	Biology II Laboratory
BY 162	Biology II Laboratory
BY 224	Ecology Laboratory
BY 322	Microbiology Laboratory
BY 362	Comparative Physiology Laboratory
BY 473	Human Anatomy and Physiology I Laboratory
BY 474	Human Anatomy and Physiology II Laboratory

*Students should consult with the Biology Chair to determine whether AP Biology will satisfy the BY 140 and BY 160 requirements.

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.

A minor in Biology, Behavior, and Society is available to students in all degree programs. To obtain a minor, students must complete 20 credits of required courses, and electives from outside the students declared major.

Five required courses	
BY/PY 340	Behavioral Ecology and Sociobiology
BY/PY 357	Human Cognitive Evolution
HIST 270	Introduction to Culture, Society & Biology
SAS 300	Arts and Sciences Seminar
SAS 499*	Biology, Behavior and Society Minor Portfolio

Choose one course from each of the two categories	
Category I	
ANTH 220	Understanding the Americas
ANTH 225	Global Perspectives on Sexuality
ANTH 230	Introduction to Race and Ethnicity
ANTH 270	Environment, Technology and Society
ANTH 325	Sex and Commerce
ANTH 330	Men and Masculinities
HIST 320	Medicine and Society in America
HIST 326	Modern Sex
HIST 327	History of Women and Gender in America
HIST 328	History of Gender and Sex
HIST 329	History of the American Family
HIST 342	War and Gender
HIST 350	History of Nazi Germany
HIST 351	History of the Holocaust
SOC 330	Health, Wealth, Inequality and the Environment
POL/ SOC 350	International Development and Social Change
SOC 385	Food and Society
SS 220	Introduction to Gender
Category II	
BY/ PY 319	Current Readings in Animal Behavior
BY/ PY 358	Animal Learning and Cognition
BY 420	Evolution
BY 460	Neurobiology

Choose one course from each of the two categories	
Category I	
ANTH 220	Understanding the Americas
ANTH 225	Global Perspectives on Sexuality
ANTH 230	Introduction to Race and Ethnicity
ANTH 270	Environment, Technology and Society
ANTH 325	Sex and Commerce
EC 384	Game Theory and Economic Strategy
HIST/ PY 459	Neuroscience and Society
OS 286/ PY 286	Organizational Behavior I
PH 253	Social Psychology
PY 310	Human Sexuality
PY 315	Personal Relationships
PY 360	Learning and Memory
PY 453	Advanced Topics in Social Psychology
PY 461	Judgment and Decision Making
PY 463	Health Psychology

*A student, to complete the minor, will take SAS 499 as an independent study course under the mentorship of the student's minor advisor. The student will provide a portfolio based on:

1. Term papers of equivalent products from the three major required courses
2. Representative course material that shows mastery of subject matter area
3. 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.

INSTITUTE FOR A SUSTAINABLE ENVIRONMENT

Susan E. Powers, Director and the Spence Professor in Sustainable Environmental Systems
Alan Rossner, Associate Director for Education

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 interdisciplinary 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 sustainability 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 and social systems that is needed for informed decisions and policies. Fostering links among its affiliates is facilitated by its activities, including ISE sponsored workshops, seminars, and student co-curricular activities. Faculty and students also participate in ISE's interdisciplinary offerings.

BS In Environmental Science & Sustainability

Alan Rossner, Director

Concerns about environmental issues and how sustainable our natural and human resources will be in the future are increasingly at the forefront of governmental policy, corporate planning, and the day-to-day choices of families like yours. Researchers focus on understanding and addressing important topics such as climate change, depletion of the ozone layer, habitat destruction, and air and water pollution. Corporations seek new production methods and materials to decrease industrial emissions and improve processes to minimize risk to employees and communities from exposure to environmental hazards. At home, we minimize our carbon footprint, reduce our water use and attempt to reduce our solid waste through recycling, and purchase products with less packaging.

Confronting contemporary environmental and broader sustainability challenges require creative and interdisciplinary solutions. Successful environmental problem-solvers understand the fundamental principles of science and how they apply to real-life issues, while also grasping the historical, social, and political contexts that influence

environmental policy and action. Clarkson University's Environmental Science & Sustainability (ES&S) program prepares graduates to become effective leaders in this field by providing a broad, interdisciplinary education that integrates science, policy, and hands-on experience. Students engage in project-based and laboratory courses, collaborate on research with faculty and graduate students, and complete a capstone project that addresses a real-world sustainability challenge. The coursework is challenging but flexible, allowing students significant freedom in choosing their emphasis, through selection of one of four concentrations and options for minors or double majors. The curriculum is also well suited as a preparatory degree for students interested in graduate degrees in environmental science, law or policy, business or health science.

The four concentrations within the ES&S degree include:

Environmental Health & Safety	Environmental Policy
Environmental Science	Sustainable Solutions

These concentrations are also available as stand-alone minors, and many ES&S students enhance their studies with minors in biology, project management, environmental engineering, political science, or chemistry.

Environmental Science, Environmental Policy, Environmental Health and Safety and Sustainability are interconnected disciplines crucial for addressing contemporary environmental challenges and ensuring the well-being of both ecosystems and human populations. While each field has its distinct focus, they intersect in various ways, contributing to a holistic approach to minimizing and managing risk to environmental systems and human communities

Environmental Science is a multidisciplinary field that studies the interactions between the environment and various natural and human systems. It encompasses the study of ecosystems, biodiversity, pollution, climate change, and other environmental phenomena. Environmental scientists conduct research and field investigations to understand the underlying processes driving environmental change and to develop solutions for mitigating negative impacts.

Environmental Policy plays a pivotal role in guiding actions and decisions aimed at preserving and enhancing the quality of our environment and public health. It encompasses a set of principles, regulations, and directives established by governments, organizations, and communities to address pressing environmental issues effectively. Environmental policies are crafted based on scientific evidence, societal values, and economic considerations, with the overarching goal of achieving sustainable development while minimizing adverse environmental and associated social/public health impacts.

Environmental Health and Safety primarily addresses safeguarding human health and well-being in the context of exposure to stressors that impact health. It encompasses assessing and managing risks associated with environmental pollutants, occupational hazards, and public health concerns.

Sustainability serves as a guiding principle that underpins efforts to preserve our planet in a manner to support healthy and prosperous societies. Sustainability initiatives aim to promote efficient and appropriate use of natural resources, minimize environmental degradation, and foster just and equitable societies. The United Nations Sustainable Development goals provide a perspective on the breadth of across all aspects of life.

Program Learning Outcomes

Core knowledge and application of key concepts, scientific principles, and overarching themes in ES&S

- Effectively apply basic principles of the natural, physical and social sciences with a systems perspective to analyze and understand interactions between social and environmental processes
- Identify significant cultural and ethical issues related to human and natural systems and be able to address these issues in an informed, just and equitable manner.
- Techniques and approaches in scientific inquiry, problem solving and critical thinking
- Gather, interpret, and evaluate quantitative and qualitative sets of information from a variety of credible scientific and non-scientific sources.
- Utilize the appropriate methodological tools necessary to analyze significant issues and propose solutions related to environmental science, sustainability and their concentration of study.
- Design solutions to real world problems in collaboration with external partners.

Professional skills

- Communicate orally, visually, and in writing, to a variety of audiences, the essential elements of environmental inquiry and design.
- Work collaboratively across disciplines to address significant issues in environmental science and sustainability.
- Develop skills for lifelong learning and standards of professional behavior that include ethics, equity, diversity and justice sustainability challenges.

Students can complete their BS ES&S degree within four years and 120 credit hours by following the 8-semester plans below. The first year classes are the same with the exception of one choice that helps the student to explore their potential concentration. Otherwise, the concentrations can be decided before the 3rd or 4th semester without any consequence. Please see the ISE Undergraduate Handbook for advising sheets and lists of elective courses that meet the various restricted elective categories.

ES&S with Concentration - Environmental Health & Safety

FIRST YEAR FALL				FIRST YEAR SPRING		
BY140	Biology I	3		BY160	Cellular & Molecular Biology	3
BY142	Biology Lab (1)	2		CM 131	General Chemistry I with Lab (3)	4
MA180	Intro to College Math (2)	4		MA181	Basic Calculus (2)	3
EV100	Intro to Env. Science & Policy	1			Knowledge Area #1	3
UNIV190	The Clarkson Seminar	3			Free Elective	3
FY100	Freshman Seminar	1				
	Total Credits	**14**			**Total Credits**	**16**
SECOND YEAR FALL				SECOND YEAR SPRING		
EV305	Sustainability & Environment	3		CM132	General Chemistry II w/Lab	4
EV280	Environmental Science	3		STAT318	Biostatistics (or STAT 282)	4
PH141	Physics for Life Science I (4)	4		EHS309	Environ & Occup. Health	3
BY222	General Ecology	3		EHS310	Intro to IH Lab	2
	Knowledge Area #2 (DEI)	3			Knowledge Area #3	3
	Total Credits	**16**			**Total Credits**	**16**
THIRD YEAR FALL <or ADK Semester>				THIRD YEAR SPRING		
CE301	GIS*	3		PH142	Physics for Life Science II (4)	4
	EnvSci/Earth Sci elective*	3			Core science (5)	3
	KA #4 (soc/comm)*	3			EHS Elective	3
	Pol/Econ elective*	3			Prof Prep Elective	3
	Free Elective*	3			Free Elective	3
	Total Credits	**15**			**Total Credits**	**16**
FOURTH YEAR FALL				FOURTH YEAR SPRING		
	EHS Elective	3		ES 432	Risk Analysis	3
EV400	Capstone Project	2		EV401	Capstone Project	1
	Core science (5)	3			EHS elective	3
POL 470	Environmental Policy (KA#5)	3			Free Elective	3
	Free Elective	3			Free Elective	3
	Total Credits	**14**			**Total Credits**	**13**
					8 semester total	**120**

* satisfied with the ADK semester courses
(1) BY142 recommended, not required. Or Chem I could be taken first semester for a total of 16 credits
(2) CALC I and CALC II could be substituted for the MA180 / 181 math sequence
(3) CM103+105 can be used as an acceptable substitute for CM131
(4) PH 131 and 132 can be substituted for PH141 and 142
(5) Need 2 from this list (OChem, Spec, A&P, Anal. Chem, Microbio)

Among these courses, students must achieve the following:

Correct distribution of Clarkson KAs
1 DEI focus
1 project designated course* (other than the capstone)

ES&S with Concentration - Environmental Science

FIRST YEAR FALL				FIRST YEAR SPRING		
BY140	Biology I	3		BY160	Cellular & Molecular Biology	3
BY142	Biology Lab (1)	2		CM 131	General Chemistry I with Lab (3)	4
MA180	Intro to College Math (2)	4		MA181	Basic Calculus (2)	3
EV100	Intro to Env. Science & Policy	1			Knowledge Area #1	3
UNIV190	The Clarkson Seminar	3			Free Elective	3
FY100	Freshman Seminar	1				
	Total Credits	**14**			**Total Credits**	**16**
SECOND YEAR FALL				SECOND YEAR SPRING		
EV305	Sustainability & Environment	3		CM132	General Chemistry II w/Lab	4
EV280	Environmental Science	3		STAT318	Biostatistics (or STAT 282)	4
PH141	Physics for Life Science I (4)	4		EHS309	Environ & Occup. Health	3
BY222	General Ecology	3		EHS310	Intro to IH Lab (5)	2
	Knowledge Area #2 (5)	3		BY328	Conservation Biology (KA #3)	3
	Total Credits	**16**			**Total Credits**	**16**
THIRD YEAR FALL <or ADK Semester>				THIRD YEAR SPRING		
CE301	GIS*	3		PH142	Physics for Life Science II (4)	4
	EnvSci elective*	3			Earth science elective	3
	KA #4 (soc/comm)*	3		BY320	Microbiology	3
	Pol/Econ elective*	3			Prof Prep Elective	3
	Free Elective*	3			Free Elective	3
	Total Credits	**15**			**Total Credits**	**16**
FOURTH YEAR FALL				FOURTH YEAR SPRING		
POL 470	Environmental Policy (KA#5)	3			Env Science elective	3
EV400	Capstone Project	2		EV401	Capstone Project	1
	Earth science elective	3			Soc/Comm elective (DEI)	3
	Free Elective	3			Free Elective	3
	Free Elective	3			Free Elective	3
	Total Credits	**14**			**Total Credits**	**13**
					8 semester total	**120**

*satisfied with the ADK semester courses
(1) BY142 recommended, not required. Or Chem I could be taken first semester for a total of 16 credits
(2) Calc I and Calc II could be substituted for the MA180 / 181 math sequence
(3) CM103+105 can be used as an acceptable substitute for CM131
(4) PH 131 and 132 can be substituted for PH141 and 142
(5) BY224 (fall) or EHS310 (spring) required. KA#2 fills the other slot
Among these courses, students must achieve the following:

Correct distribution of Clarkson KAs
1 DEI focus
1 project designated course* (other than the capstone)

ES&S with Concentration – Sustainable Solutions						
FIRST YEAR FALL					FIRST YEAR SPRING	
BY140	Biology I	3		ES238	Intro to Energy Systems (KA#1)	3
BY142	Biology Lab (1)	2		CM 131	General Chemistry I with Lab (3)	4
MA180	Intro to College Math (2)	4		MA181	Basic Calculus (2)	3
EV100	Intro to Env. Science & Policy	1			Soc/Comm elec. (KA#2, DEI)	3
UNIV190	The Clarkson Seminar	3			Free Elective	3
FY100	Freshman Seminar	1				
	Total Credits	**14**			**Total Credits**	**16**
SECOND YEAR FALL					SECOND YEAR SPRING	
EV305	Sustainability & Environment	3		STAT282	Statistics	3
EV280	Environmental Science	3			Env.Sci, Earth Sci or EHS elec	3
BY222	General Ecology	3			Soc/Comm elective (KA#3)	3
BY224	Ecology Lab	2			Free Elective	3
PH141	Physics for Life Science I (4)	4			Free Elective	3
	Total Credits	**15**			**Total Credits**	**15**
THIRD YEAR FALL <or ADK Semester>					THIRD YEAR SPRING	
CE301	GIS*	3			Sust. Business choice	3
	EnvSci/Earth Sci elective*	3			Climate Change choice	3
	Sust SocSci choice (KA #4)*	3			Pol/Econ elec	3
	Pol/Econ elective*	3			Prof Prep Elective	3
	Free Elective*	3			Free Elective	3
	Total Credits	**15**			**Total Credits**	**15**
FOURTH YEAR FALL					FOURTH YEAR SPRING	
POL 470	Environmental Policy (KA#5)	3			EnvSci elective	3
EV400	Capstone Project	3			Sust. Solutions Choice	3
	Sust. Solutions Choice	3			Free Elective	3

	Free Elective	3			Free Elective	3
	Free Elective	3			Free Elective	3
	Total Credits	**15**			**Total Credits**	**15**
					8 semester total	**120**

* satisfied with the ADK semester courses
(1) BY142 recommended, not required. Or Chem I could be taken first semester for a total of 16 credits
(2) Calc I and Calc II could be substituted for the MA180 / 181 math sequence
(3) CM103+105 can be used as an acceptable substitute for CM131
(4) PH 131 and 132 can be substituted for PH141 and 142
Among these courses, students must achieve the following:

Correct distribution of Clarkson KAs
1 DEI focus
1 project designated course* (other than the capstone)

ES&S with Concentration – Environmental Policy

FIRST YEAR FALL					FIRST YEAR SPRING	
BY140	Biology I	3		POL222 or 260	Am Pol OR Intro Public Pol. (KA#1)	3
BY142	Biology Lab (1)	2		CM 131	General Chemistry I with Lab (3)	4
MA180	Intro to College Math (2)	4		MA181	Basic Calculus (2)	3
EV100	Intro to Env. Science & Policy	1			Soc/Comm elec. (KA#2, DEI)	3
UNIV190	The Clarkson Seminar	3			Free Elective	3
FY100	Freshman Seminar	1				
	Total Credits	**14**			**Total Credits**	**16**
SECOND YEAR FALL					SECOND YEAR SPRING	
EV305	Sustainability & Environment	3			KA#4	3
EV280	Environmental Science	3			Env.Sci, Earth Sci or EHS elec	3
BY222	General Ecology	3			Pol/Econ elec	3
BY224	Ecology Lab	2			Free Elective	3
EC150	Microeconomics	3			Free Elective	3
	Total Credits	**14**			**Total Credits**	**15**
THIRD YEAR FALL					THIRD YEAR SPRING	
CE301	GIS*	3		STAT282	Statistics	3
	EnvSci/Earth Sci elective*	3			Soc/Com elec. (ideally Comm 428)	3
	KA #4 (soc/comm)*	3		EC360	Env. Economics	3
	Pol/Econ elective*	3			Prof Prep Elective	3
	Free Elective*	3			Free Elective	3
	Total Credits	**15**			**Total Credits**	**15**

FOURTH YEAR FALL					FOURTH YEAR SPRING	
POL 470	Environmental Policy (KA#5)	3			Pol/Econ elective	3
EV400	Capstone Project	3			Soc/Comm elective	3
PH141	Physics for Life Science I (4)	4			Free Elective	3
	Free Elective	3			Free Elective	3
	Free Elective	3			Free Elective	3
	Total Credits	**16**			**Total Credits**	**15**
					8 semester total	**120**

* satisfied with the ADK semester courses
(1) BY142 recommended, not required. Or Chem I could be taken first semester for a total of 16 credits
(2) Calc I and Calc II could be substituted for the MA180 / 181 math sequence
(3) CM103+105 can be used as an acceptable substitute for CM131
(4) PH 131 and 132 can be substituted for PH141 and 142
Among these courses, students must achieve the following:

Correct distribution of Clarkson KAs
1 DEI focus
1 project designated course* (other than the capstone)

Minors in Institute for Sustainable Environment

Minor In Environmental Health & Safety

A minor in Environmental Health & Safety Is available to all students except those majoring in the Environmental Science & Sustainability BS degree program. To obtain a minor, a student must successfully complete the 17 credit hours outlined below:

A.	**Required Courses**	
	EHS309 Introduction to Industrial Hygiene	3
	EHS310 Introduction to Industrial Hygiene Lab	2
	EV280 Environmental Science	3
B.	**Select any TWO EHS courses** (see the list updated on the university minors website)	6
C.	**Select ONE relevant Policy, Social Science, Comm or Econ class** (see the list updated on the university minors website)	3

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

A minor in Environmental Science is available to all students except those majoring in the Environmental Science & Sustainability BS degree program. To obtain a minor, a student must successfully complete the 18 credit hours outlined below:

A. Required Courses	
BY222 Ecology	3
EV280 Environmental Science (or CE340)	3
EV305 Sustainability & the Environment (or CE486)	3
B. Select ONE course for each of these three categories courses (see the complete lists updated on the university minors website)	
Earth Science elective	3
Environmental Science Elective	3
Policy, Social Science, Comm or Econ. Elective	3

Note: Classes from the Adirondack semester can substitute for the Ecology (or Env. Science) requirement and the Policy, Social Science, Comm or Econ. Elective

Minor in Environmental Policy

A minor in Environmental Policy is available to all students except those majoring in the Environmental Science & Sustainability BS degree program. To obtain a minor, a student must successfully complete the 18 credit hours outlined below:

A. Required Courses	
EV280 Environmental Science (or CE340)	3
EV305 Sustainability & the Environment (or CE486)	3
Environmental Policy (POL470)	3
B. Select THREE relevant Policy, Social Science, Comm or Econ classes (see the list updated on the university minors website)	9

Note: Classes from the Adirondack semester can substitute for 2 of the 3 required the Policy, Social Science, Comm or Econ. Electives

Minor in Sustainable Solutions

A minor in Sustainable Solutions is available to all students except those majoring in the Environmental Science & Sustainability BS degree program. To obtain a minor, a student must successfully complete the 18 credit hours outlined below:

A. Core Courses - choose TWO of these three	6
EV280 Environmental Science (or CE340)	
EV305 Sustainability & the Environment (or CE486)	
Introductions to Energy Systems (ES238)	
B. Select ONE Sustainable Solutions Elective* (see the list updated on the university minors website)	3
C. Select ONE course from THREE of these four categories (see the complete lists updated on the university minors website)	9
Climate Change Choice (ES436 or CE 316)	
Sust. Social Science choice: (Soc 330, ANTH 255, ANTH 285, EV320)*	
Sust. Business choice (EC360, OS352, SB/EM361, EM121,EM/OM451)	
DEI designated course	

ISE Research

Undergraduate students can participate in a wide variety of interdisciplinary research projects with faculty from across campus. Many undergraduate students participate in ISE related research for credit or pay and present their work at the annual Research and Project Showcase (RAPS). Inquire in the ISE office to learn more about the opportunities that match your interests.

INSTITUTE FOR STEM EDUCATION

Kathleen R. Kavanagh, Director

The Mission of the Institute for STEM Education (STEM Ed) is

To combine disciplinary rigor with pedagogical science in outreach, teacher training, graduate student and faculty professional development to establish Clarkson University as a national leader in all aspects of STEM Education.

Vision

STEM Ed will:

- Build a reputation of student achievement, exemplary pedagogy, and K12 outreach, STEM Ed will focus on engagement and workforce preparation,
- Support faculty across disciplines and campuses to create learning experiences and curriculum that support all undergraduate and graduate students to be successful beyond Clarkson.
- Deploy Clarkson values of collaborative and innovative STEM teaching and learning to impact undergraduate and graduate student recruitment, retention and education of students from diverse backgrounds and on teacher preparation for K-12 and college-level.

STEM Ed's current objectives include coordination and expansion of Clarkson's STEM Education activities:

1. Expand the TA training "boot camp" both internally and externally and develop an undergraduate TA training module
2. Outreach projects and new grant opportunities coordinated across all three campuses
3. Coordinate student work experiences in educational projects
4. Informal education
5. Academic Retention Programs (First Year Council etc.)
6. Create and implement programs to support faculty in the classroom and improve learning experiences for Clarkson students
7. Dissemination of Scholarship of Teaching and Learning both on campus and in publications
8. Advise students in the pre-teaching minor

Through all of this, STEM Ed will further enhance Clarkson's reputation on the national and international stage.

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.

Clarkson's current undergraduate interdisciplinary degree programs are: BS in Engineering and Management, BS in Environmental Science & Sustainability, and the BS in Software Engineering, in which there also is a minor.

The BS in Engineering and Management is housed in the Reh School of Business. See the Reh School's section of this Catalog for detailed information.

BS In Social Documentation Double Major

Clarkson is no longer accepting applications for this double major. Please see historical catalogs for program information.

BS In Software Engineering

Paul McGrath, Department Chair

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 for execution, 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, security, 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 manage the project so that it is produced in an economical, timely manner.

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.

Program Educational Objectives (PEOs)

PEO1: Graduates of the Software Engineering Program are expected to have advanced their careers as contributing professionals in the software industry who apply fundamental software engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

PEO2: Graduates of the Software Engineering Program are expected to have become well-rounded citizens who rely on their education to serve society with an understanding of their professional and ethical responsibilities.

PEO3: Graduates of the Software Engineering Program are expected to have become effective and responsible collaborators who function well in diverse team environments in the software industry. Some graduates will have emerged as leaders.

PEO4: Graduates of the Software Engineering Program are expected to have exhibited intellectual growth and pursue continual innovation in software engineering. Those graduates who are especially talented and motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

Student Outcomes (SOs)

In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

In the context of the software engineering discipline, this means that graduates of the program will:

1. Have a fundamental understanding of computer systems
2. Be able to apply engineering principles to software design and construction, having developed the ability to:
    a. Develop software requirements and functional specifications
    b. Use proven techniques to design software structure before it is implemented
    c. Apply established verification and validation techniques
    d. Understand the importance of constructing large software systems using standardized components and reusing existing code where possible
    e. Use software tools as effective aids in all phases of software development
    f. Design, develop, and deliver software in a cost effective manner
3. Have experience with issues encountered at every stage in the software life-cycle
4. Understand how to manage the development of software intensive systems
5. Be able to work on an interdisciplinary team of software components of a system
6. Have good interpersonal and communication skills
7. Be able to readily assimilate new technologies
8. Understand the impact their discipline has on society

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.

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 Department and the Computer Science Department. That benefits the students because they master the application of theory as well as knowledge and understanding of software processes 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.

Requirements for the BS in Software Engineering:

1. Complete at least 120 credit hours of course work with at least a 2.000 GPA, both overall and in the Software Engineering major courses.
2. Complete the course requirements listed in the table below.

Software Engineering Curriculum					
First Semester*		**Credits**	**Second Semester***		**Credits**
CM131	Chemistry I	4	CS141	Intro to Computer Science I	4
PH131	Physics I	4	PH132	Physics II	4
MA131	Calculus I	3	MA132	Calculus II	3
UNIV190	Clarkson Seminar	3	ES110	Engineering & Society, or Equivalent Course[1]	3
FY100	First-Year Seminar	1	ES100	Introduction to Engineering Use of the Computer	2
Total		15			16

Third Semester		Credits	Fourth Semester		Credits
EE 262	Intro to Object Oriented Programming and Software Design	3	EE321	Syst & Signals or ES or Sci. Elective	3
EE 264	Digital Design	3	EE 260	Embedded Systems	3
ES 250	Electrical Science	3	MA 211	Foundations	3
MA 232	Differential Equations	3	MA 231	Calculus III	3
	KA/UC Elective[1]	3		KA/ UC Elective (EC)	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EE 363	Generic Programming and Software Components	3	CS 344	Algorithms and Data Structures	3
EE 407	Computer Networks	3	EE 361	Fundamentals of Software Engineering	3
EE 408	Software Design for Visual Environment	3	EE 368	Software Engineering	3
MA 381/ STAT 383	Probability/ Probability and Statistics	3	Undesignated Elective		3
	KA/ UC Elective[1]	3	EE 468	Database Systems	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**

CS 341	Programming Languages	3	CS 444	Operating Systems	3
EE 418	Senior Design	3	CS 458	Formal Methods for Program Verification	3
	Undesignated Elective	3		Professional Elective [2]	3
ES 499	Professional Experience	0		Undesignated Elective[3]	3
	Professional Elective[2]	3	EE 466	Computer Architecture	3
	KA/ UC Elective[1]	3			
Total		15	Total		15

*This is a typical first- and second-semester curriculum sequence. Not all students will complete these courses in the first year. For example, some students will take ES110 in lieu of PH131 in the first semester, then PH131 in the second semester and PH132 in the third semester.

[1] 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 courses is the required ES110 (or Equivalent). One of the Knowledge Area courses must be an economics course; EC 350 is recommended.

[2] Professional Electives may be any course numbered EE 300+, CS 300+, MS 300+, AS 300+, BR 400, ME 444, COMM 341, COMM 395, or CS 242.

[3] 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.

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.

Minor in Robotics

Robotics is an interdisciplinary field that involves the application of mechanical engineering, electrical,computer and software engineering, and computer science knowledge for the design, construction and operation of automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. Commercial and Industrial robots are now in widespread use performing jobs more cheaply or with greater accuracy and reliability than humans, or that are too dirty, dangerous or dull to be suitable for humans, e.g., in manufacturing, assembly and packing, transport, earth and space exploration, surgery, weaponry, laboratory research, and the mass production of consumer and industrial goods. The Minor in Robotics is designed to provide students with a solid and coherent introduction to field and consists of two parts: four required core courses (9 credit hours) to give students a strong, working foundation in the associated technology and three elective courses (9 credit hours) that allow students to explore various sub-areas within the field or specialize more deeply in one area.

Requirements

To graduate with a Minor in Robotics, students must earn an average GPA of 2.0 in six courses (18 credit hours) that satisfy the following requirements:

Core Courses (required)

1. MA339- Applied Linear Algebra, 3 credits, Fall/Spring (Prerequisites: MA132; MA230/231), or MA330- Advanced Engineering Mathematics, 3 credits, Fall/Spring (Prereq.: MA231 and MA232)
2. EE455- Introduction to Mobile Robotics, 3 credits, Spring (Prereq.: EE321, EE/ME324, or MA339)
3. EE456- Introduction to Robot Manipulators, 3 credits, Fall (Prereq.: EE321, EE/ME324, or MA339)
4. MP414- Applied Robotics or equivalent robotics project experience, 0 credits (P/NC), Spring/Fall

Elective Courses (minimum of three courses, I.e., nine {9) credits, from the following·):

ECE Department

EE260 Embedded Systems (Prerequisite: CS141)
EE401 Digital Signal Processing (Prerequisites: EE321)
EE408 Software Design for Visual Environments (Prerequisite: EE262)
EE450 Control Systems (Prerequisites: EE324)
EE451 Digital Control (Prerequisites: EE321)
EE452 Optimization Techniques In Engineering (Prerequisites: MA339)
EE465 Computer Graphics (Prereq.: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite)
EE506 Image Processing and Computer Vision (Prerequisites: EE321)
EE652 Computer Vision (Prerequisites: CS344 and MA339 with minimum 3.5 GPA and junior standing)

MAE Department:

ME385 Design of Electromechanical Systems (Prerequisites: ES250, EE/ME324)
ME443 Optimal Engineering (Prerequisites: ME350 or ME341)
ME444 Computer Aided Engineering (Prerequisites: ES100 or EM121, and MA231)
ME450 Control Systems (Prerequisites: AE/EE/ME324 or Corequisite: EE321)

CS Department:

CS449 Computational Learning (Prerequisites: CS344 and CS345)
CS451 Artificial Intelligence (Prerequisite: CS344)
CS452 Computer Graphics (Prerequisite: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite)
CS459 Human-Computer Interaction (Prerequisites: proficiency in C++, Java, or C)
CS461 Mixed Reality (Prerequisites: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite)
CS465 Mobile Robotics/Human-Robot Interaction (Prerequisite: CS344)
CS652 Computer Vision (Prerequisites: CS344 and MA339 with minimum 3.5 GPA and junior standing)

*Some course substitutions are possible: a list of acceptable substitutions will be maintained by the School of Engineering in conjunction with the MAE, ECE, and CS Departments and updated annually.

In addition, students must satisfy the following University requirements regarding Minors:

A minimum 2.0 grade point average is required in the minor;
Only zero credit hour courses can be designated as pass/no entry;

At least one-fourth of the credit hours required must be completed at Clarkson, unless an exception is approved by the Dean of the minor program.

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:

1. CS 141 CS 142, and CS 344 or CS 141, EE 262, and EE 363
2. CS 242 or EE 408
3. EE 368 or CS 350
4. One of EE 465,CS 452, CS 455,EE 407, EE 468,CS 460, or other course approved by the Software Engineering Program Committee

NON-DEGREE 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, Air Force, and Space Force. Upon graduation and successful completion of either the Army program in Military Science or the Air and Space Force program in Air, Space, and Cyberspace Studies, students receive appointments as commissioned officers at the rank of second lieutenant. Each program provides a Basic Course in the freshman 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 basic camp in the summer prior to their junior year. There are other entry options available for veterans and graduate students. Students may enroll in either program's Basic Course without incurring a military service obligation.

Admission to junior and senior (300- and 400-) level classes is contingent upon successful completion of freshman and sophomore curriculum (or its equivalent). In special situations, students may qualify for admission into Army ROTC Advanced Course by meeting other criteria. Non-ROTC students are eligible to enroll in Air Force ROTC 300- and 400-level curriculum with the approval of the instructor. Academic credit toward graduation requirements for Military Science and Air, Space, and Cyberspace Studies courses is determined by the individual schools at Clarkson. Interested individuals should contact the Army ROTC Golden Knights Battalion or Air Force ROTC Detachment 536 direct.

Uniforms and equipment required for ROTC courses are furnished free of charge to students in the Basic and Advanced Courses. Advanced-course students are currently paid a monthly (tax-free) stipend on a 10-month-per-year basis to offset living costs. Additionally, qualified students may be eligible to compete for Army, Air Force, and Space Force ROTC scholarships.

Military Science (Army ROTC)
John Sowder, Chair & Professor of Military Science
Scott Toth, Recruiting and Enrollment Officer

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 80 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 Advanced Camp. It is a four-week summer camp that evaluates and develops Army ROTC cadets. This camp generally takes place between your junior and senior years of college. Cadets may 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 individual soldier skills. Once each semester, cadets participate in an extended two-day field training exercise, designed to challenge each cadet's leadership and military skills.

The Golden Knight Battalion also participate in additional events during the year such as a military ball, athletic events, Airborne school, Air Assault school, and Army internships during the summers.

After graduation and satisfaction of ROTC requirements, cadets are commissioned as second lieutenants into one of 17 specialized branches in Active Army, Army Reserve or National Guard. There are also opportunities to request to attend Medical School or Law School.

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:

1. Full tuition and educational fees
2. $1,200 per year for textbooks and classroom supplies
3. $420 per month (tax-free) stipend for up to 10 months per year
4. Clarkson offers all scholarship recipients a Clarkson ROTC Incentive Scholarship to be used to defray the costs of room and board

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, 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. We utilize the local police range for rifle marksmanship training.

Other Activities

There are many extracurricular activities open to ROTC cadets, including the Ranger Challenge Team, Color Guard, Army 10-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*					
First Semester		**Credits**	**Second Semester**		**Credits**
MS 111	Leadership and Personal Development	1	MS 112	Introduction to Tactical Leadership	1
Third Semester		**Credits**	**Fourth Semester**		**Credits**
MS 221	Innovative Team Leadership	2	MS 222	Foundations of Tactical Leadership	2
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
MS 331	Adaptive Tactical Leadership	3	MS 332	Leadership in Changing Environment	3

Seventh Semester		Credits	Eighth Semester		Credits
MS 441	Developing Adaptive Leaders	3	MS 442	Leadership in a Complex World	3

*Courses may be applicable as free electives in some majors where noted. Completion of this program may be applicable towards the award of a minor in Military Leadership Studies. Consult individual departments for details.

If you have any questions or would like to speak with someone about Army ROTC, contact the Golden Knight Battalion at 315-265-2180 or email armyrotc@clarkson.edu.

Air, Space, & Cyberspace Studies (Air Force ROTC)
Lt Col Andrew Washburn, Chair and Professor of Air, Space, and Cyberspace 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 and Space Force. Upon graduation with at least a bachelor's degree, students are commissioned as second lieutenants in the active duty Air Force or Space Force. A commission is an appointment as a military officer by the President of the United States.

AFROTC is normally a four-year program divided into two parts, the General Military Course (GMC) for freshmen and sophomores, and the Professional Officer Course (POC) for juniors and seniors. All students also complete a Leadership Laboratory (LLAB) each semester.

General Military Course
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 providing a fundamental understanding of leadership and team building to include listening, self-assessment, problem solving, and conflict management. Students do not need to be AFROTC cadets to enroll in the academic courses but cannot enroll in the Leadership Laboratory.

Field Training Summer Training
After successful completion of the GMC, cadets are scheduled to attend Field Training during the summer between the sophomore and junior year. Field Training is an intense,

two-week, hands-on leadership challenge. Cadets are evaluated on their leadership ability, mastery of military customs and courtesies, and drill and ceremonies. Cadets are exposed to a variety of challenges which forces them to work as a team, critically evaluate situations, and perform under stress. Field Training is often a life-changing experience that builds self-confidence and fine-tunes leadership skills.

Professional Officer Course

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 builds on the leadership and management concepts taught in the sophomore curriculum focusing on their application within the Department of the Air Force. 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 and Space Force. The POC involves a three credit hour course and a two hour Leadership Laboratory (LLAB) each semester. POC cadets are placed in leadership positions and are charged with running the cadet wing. Non-AFROTC students may be eligible to enroll in the academic courses following completion of the GMC, or equivalent, courses. Contact the department for more information.

Leadership Laboratory

LLAB is a hands-on leadership training program. During LLAB, cadets practice the knowledge and skills learned in the academic classes and are instructed in skills they will need for a thriving military career. POC members are responsible for planning and executing LLAB, as well as other extracurricular activities such as formal dinners and awards ceremonies. Cadets are also expected to participate in 2 hours of Physical Training (PT) per week during each semester. Non-AFROTC cadets are not eligible to attend LLAB or PT.

Scholarships

Merit-based tuition scholarships are available to AFROTC cadets but are not required to join the program. Scholarships vary from $18,000 to full tuition. Below is a list of current scholarships:

1. Type I – Full tuition and fees scholarship
2. Type II - $18,000 towards tuition and fees
3. General Charles McGee Leadership Award - $18,000 towards tuition and fees for two years or can be converted to a $10,000 annual housing scholarship. This award is provided to all cadets entering the POC who are not already on scholarship upon completion of FT

All scholarships include the following:

1. Free room and board (Clarkson incentive)
2. Monthly Stipend during the academic year
3. Book allowance

Air, Space, and Cyberspace Studies Curriculum*					
First Semester		**Credits**	**Second Semester**		**Credits**
AS101	Heritage and Values I	1	AS102	Heritage and Values II	1
AS103	Leadership Laboratory	0	AS104	Leadership Laboratory	0
Third Semester		**Credits**	**Fourth Semester**		**Credits**
AS201	Team and Leadership Fundamentals I	1	AS202	Team and Leadership Fundamentals II	1
AS203	Leadership Laboratory	0	AS204	Leadership Laboratory	0
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
AS 301	Leading People and Effective Communication I	3	AS 302	Leading People and Effective Communication II	3
AS303	Leadership Laboratory	0	AS304	Leadership Laboratory	0
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
AS 401	National Security, Leadership Responsibilities and Commissioning Preparation I	3	AS 402	National Security, Leadership Responsibilities and Commissioning Preparation II	3
AS403	Leadership Laboratory	0	AS404	Leadership Laboratory	0

*Courses may be applicable as free electives in some majors where noted. Completion of this program may be applicable towards the award of a minor in Military Leadership Studies. Consult individual departments for details.

ACADEMIC CENTERS

Center for Advanced Materials Processing

Devon A. Shipp, Director

The Center for Advanced Materials Processing (CAMP) is a Center for Advanced Technology (CAT) funded by New York's Empire State Development Division of Science Technology and Innovation (ESD-NYSTAR).

CAMP's mission is to offer companies, industries and entrepreneurs a vibrant, collaborative, trusted environment in which to engage in focused applied research and technology development activities intended to advance innovation, improve products, solve manufacturing challenges and/or develop new products. CAMP's overarching goal is to contribute significantly to economic growth in New York State. Our main objectives are to:

1. Form collaborative relationships with industry, corporations and entrepreneurs in NYS to assist them in accelerating innovation, discovering and implementing next generation materials, addressing real-world challenges and fostering growth of their businesses.
2. Perform applied research, technology development and technology transfer activities related to the synthesis, processing and design of advanced materials to benefit industry and corporations.
3. Develop the next-generation, high tech workforce by providing excellent education and real-world research/development experiences needed by NY industry and companies.

CAMP relies on faculty and students in four core capability areas:

1. Materials synthesis and functionalization
2. Materials processing
3. Materials-by-design, and
4. Chemical mechanical planarization, underpinned by materials characterization and computational modeling and simulation

CAMP's industry-sponsored research program provides numerous materials science and engineering research opportunities to enrich undergraduate and graduate students' educational experience.

Center for Excellence in Healthy Water Solutions

Stefan Grimberg, Co-Director

Ensuring a healthy and sustainable future through the protection and conservation of water resources, CoEHWS' mission is to generate solutions that help protect and improve waters for a sustainable natural environment, healthy populations, resilient communities and sound economies. Additional information can be found at https://www.healthywaters.org/

Center for Air and Aquatic Resources Engineering and Sciences
Thomas M. Holsen, Director
Suresh Dhaniyala, Co-Director

The presence of contaminants in the environment can have a wide variety of negative effects including impacting public health, degrading ecosystems, harming lakes and rivers, and damaging forests and crops. Although, environmental quality has significantly improved over the past 40 years, there are still a number of problems that are attributed to the release of contaminants including the widespread loss of environmental services, climate change, harmful algal blooms, and emerging contaminants including per- and polyfluoroalkyl substances (PFAS). Clarkson University has significant resources in people and equipment that focus on the management of air, water and soil pollution. CAARES is the center that brings together this world-class expertise. CAARES laboratory, office space, and equipment including an aerosol wind tunnel; aerosol sensors, analyzers, and spectrometer; air and water field sampling platforms including Clarkson's 25 foot coastal research vessel, the R.V. Lavinia; and, world class analytical equipment are available for research and education programs at Clarkson. Specific analytical instruments include high-resolution gas and liquid chromatographs, high resolution instruments for trace metals analysis, mercury analytical instrumentation, ion chromatographs and sample preparation instrumentation. Additional information can be found at https://www.clarkson.edu/caares.

Center for Rehabilitation, Engineering, Science, & Technology
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.

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 and Occupational Therapy programs, 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 Minor in Biomedical Engineering to meet this need. Combining a traditional engineering degree with this BmE Minor is an attractive opportunity for 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 Minor to augment a degree from a traditional engineering department. A similar Minor in Biomedical Science and Technology (BS&T) is available to non-engineers. Both Minors are multi- disciplinary, and will include courses from multiple schools or departments across the University. The Biomedical Engineering Minor is just one of the examples addressing Clarkson's Coulter School of Engineering's motto "Technology Serving Humanity."

Center for Identification Technology Research
Stephanie Schuckers, Director

Clarkson University is the lead university for an NSF Industry/University Cooperative Research Center, called the Center for Identification Technology Research (CITeR). Other sites include West Virginia University, University at Buffalo, Michigan State University, and IDIAP (Switzerland). CITeR focuses on biometrics, identity, and human analytics https://citer.clarkson.edu/ Over 20 affiliates, including the FBI, DOD, DHS, Qualcomm, CVS Health, and other industrial and government partners, cooperatively define, fund, and execute work to meet common needs. Applications include defense, homeland security, forensics, consumer electronics, financial services, and humanitarian applications.

Research focus areas in identification technology include:

1. Human sensing and acquisition
2. Feature extraction and processing
3. Machine learning and analytics
4. Performance and modeling
5. Multispectral and cross spectral imaging
6. Novel modalities
7. Mobile & computing
8. Social signal processing
9. Authentication & cybersecurity
10. Behavioral and soft biometrics
11. Science of Biometrics

Students are key team members for research projects which are cooperatively defined by industrial and government affiliates. At the completion of their degree, students often go to work for organizations that funded their research project. Educational programs which CITeR researchers pursue include electrical, computer, and software engineering, computer science, mathematics, among others.

Center for Metamaterials
David Crouse, Professor

The Center for Metamaterials (CfM) is an NSF-sponsored Industry/University Cooperative Research Center. The CfM's mission is to provide a collaborative, multi-university one-stop shop to research, design, fabricate and test a wide range of metamaterials, photonic crystals, and plasmonic structures. These structures and materials are nano and micro composite structures that are engineered to control light in unusual ways that are not possible with naturally occurring materials; behavior such as cloaking, channeling and stopping light, and complex light filtering are possible with such structures. Industry interest in metamaterials is growing as these materials are being used to develop new or higher performing optical, electronic and acoustic devices.

Researchers at the Center focus on precompetitive topics jointly identified by the university and industry participants as being of high value, and include fundamental research, metamaterials processing, and device and system development. The CfM projects advance the knowledge base through fundamental and applied metamaterials research and development. The projects involve research teams composed of academic researchers (professors, postdocs, research staff, graduate students and undergraduate students), industry researchers at large and small companies, and researchers from government agencies (e.g., Air Force Research Laboratory (AFRL) and U.S. Army). The intent is to nurture long-term relationships and collaborations among the university, industry, and government laboratories. The intent is also to develop and perform technology transfer of metamaterials-based technologies to the applications of renewable energy, sensing and imaging, antennas, and communication systems. Industry members participating in the Center share in the products of the research and development, the generated intellectual property, have access to laboratories, equipment and expertise, and the resulting economic benefits.

Center for Complex Systems Science
Erik Bollt, Director

Complex systems science involves the study of how many elements develop behaviors that are beyond those behaviors possible by considering the individual elements alone. While the behavior of each individual component of a system in isolation may support intricate dynamics, together the individual components interact to support group behaviors and system dynamics well beyond those possible from individual components alone.

Complex systems science is a rapidly growing and emerging field that is inherently interdisciplinary. It can be applied to a wide variety of fields including biology, medicine and cognitive science, mechanical, chemical, electrical, and civil engineering, physics and astronomy, economics and social sciences. The future of research in these fields lies in understanding not just the isolated components of a given system, but the

manner in which the individual components interact to produce “emergent” group behavior.

In contrast to “data mining” or “big data”, where a primary focus is to understand hidden patterns or structure in large data sets, complex systems science attempts to identify “causality” and uncover “universality” that exists in large scale systems. Causality and universality are due to peer and hierarchical interactions, patterns, and scaling of individual system components. Universality has been observed across a wide range of fields such as brain science, insect swarming, social science, and fluid dynamics.

Key to the advancement of complex systems science is the development and use of mathematical tools designed to understand the resultant outcome of group behaviors that are not evident when studying the behavior of individual elements alone. Mathematical tools for complex systems science are drawn from the following fields:

1. Information dynamics. The study of interaction of elements and the information flow between elements. Of particular interest is the minimum information needed to produce an outcome of important behaviors
2. Algorithmic complexity. In contrast to information dynamics and entropy of evolving systems is the concept of algorithmic complexity, Kolmogorov complexity, and the concept of minimality of description, as a contrast that intricate behavior is often opposite to simplicity of design
3. Structure and dynamics on networks, as a large number of interacting parts can give rise to behaviors that emerge from the group interactions and not implicit in any one element. Consider that collective behaviors and capabilities of an ant swarm, which is clearly not understood in terms of the behaviors of the parts. Considering networks brings in the mathematics of graph theory, but well beyond this when understanding dynamics on networks, comes complexity theory.
4. Criticality and scaling, modeling of random networks, the implications of critical phenomena to complexity, and the recent approaches to evolutionary dynamics are all part of this field. As such, understanding interactions from food webs to economies all have a universality that can be understood in terms of the science that includes hierarchical interactions. It is the characterization of such universalities that lead to complex systems as a unifying field across such disciplines
5. Technical details and the tool-sets include areas of dynamical systems and chaos theory, network theory and graph theory, information theory, thermodynamics and statistical mechanics, cellular automate, information theory, activated processes including glasses, fractals, scaling and renormalization

Center for Electric Power Systems
Thomas Ortmeyer, Director

Electric Power System Engineering is a recognized strength of Clarkson University. The electric power system is undergoing rapid dynamic change due to the development of clean energy sources, the deployment of smart grid technologies, the deregulation of the industry, and the developing growth of the electric vehicle industry. There is a strong need for research, development, and workforce training across the breadth of research areas that focus on electric power systems.

The Center for Electric Power System Research mission is to foster research collaborations across the university, and to grow our power systems research capability. The Center goal is to work closely with industry, and the Industry Advisory Board has an important role in the Center governance.

The center has a strong education mission, at the undergraduate and graduate levels, as well as in programs for practicing professionals. Our undergraduates can select the Electrical Power Engineering Concentration. This concentration is a set of 6 courses that prepare our students for careers in the electric power industry, whether working for electric power utilities, generation and utilization industries, equipment manufacturers, consultants, and government. The large majority of students in the Concentration complete one or more internships in the power industry before graduating.

ACCESS INITIATIVES OFFICE

Jennifer Ball, VP of Access Initiatives

The Access Initiatives Office oversees strategic planning for access initiatives and provides dynamic programs and training for Clarkson's students, faculty, and staff. These include ongoing opportunities to learn with and from our team through a range of methods including speakers, open dialogues, cultural festivities, workshops and more.

The Access Initiatives Office oversees several lounges, organizations, and committees at Clarkson. Our team members aim to create and support a welcoming campus community for employees and students. It is our goal to cultivate an environment that educates, empowers, and celebrates all of our students and employees.

Working in partnership with other departments, offices, institutions, and the surrounding community, it is our responsibility to recognize and support the populations represented on our campus. We believe that continuously advocating for access is necessary to achieve academic and institutional success and to prepare our students to be leaders in a diverse world.

STUDENT AFFAIRS

Clarkson Regulations

Each student is responsible for knowing the contents of the Clarkson Regulations. The Regulations contain information on student rights and responsibilities, course policies, academic regulations, academic integrity, student conduct, grievance procedures, and policy statements. For a link to the Clarkson Regulations, please visit: https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations.

Orientation

Students 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 provides the Clarkson student with experience and insight into the significance of developing intellectual and interpersonal skills simultaneously.

Clarkson's concern for new students begins even before they arrive on campus. From acceptance to arrival (for campus-based programs), students will receive relevant information pertaining to their experience, including access to an online platform to ease assimilation prior to matriculation that shares important information before students begin, their first few days, and navigating Clarkson University prior to the first day of class.

Clarkson Housing

Undergraduate students in their first, second, third, and fourth cohort years are required to live in University housing unless they are granted an exemption to the residency requirement. 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).

The Residence Life Staff provides supportive and development programming for students. All events and programs are designed to involve and engage students with the campus community and provide a healthy mix of educational, fun, and recreational activities to support the diverse interests of Clarkson students.

University housing provides accommodations ranging from traditional rooms to suites to apartments. Special attention is given to the assigning of roommates to first-year students. Most first-year students reside together in Cubley-Reynolds and Ross-Brooks (otherwise known as "the Quad") on theme-based floors. Students select from a wide variety of themes during the summer prior to arrival. Some of our housing units feature suite-type accommodations; these are typically two double rooms with interconnecting baths. Lounges and recreational areas, laundry rooms, and vending machines are located in or near each residence facility.

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 choose to do so. Students residing off campus have the option of contracting for University food service.

Cable TV and data ports are available for students in each room or apartment. Smoking is not permitted in any buildings on campus including the residence halls.

Campus housing is staffed by live-in University employees known as Area Coordinators, who supervise and train students who serve as Resident Advisors (RAs) to assist students with personal issues and a variety of educational, social, and recreational programs.

Fifth-year students are housed on campus only as space allows. 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. Students are responsible for knowing and adhering to the Residence Regulations enumerated in the University housing contract and on the University's website.

Theme Housing

Clarkson strives to create learning communities by developing innovative theme housing opportunities created around projects or entrepreneurial ventures in which students from various majors live and learn together. In addition, students are encouraged to develop meaningful proposals for living together in theme-related housing, increasing options for students with similar interests to live together while intentionally expanding the collaborative learning atmosphere of our campus residences.

Student Health & Counseling Center

Counseling Services

A Clarkson University education encompasses more than classroom learning. Challenges and transitions provide opportunities for personal, social, and academic growth and cognitive development. Counseling services are confidential and offered at no additional cost to enrolled students. Counseling services focus primarily on mental health concerns and problems including: adjustment to change, relationships, self-care, communication, career-vocational choice, academic performance, identity development, personal/sexual/social behaviors, habit change, depressed mood, stress and anxiety, loss and grieving, sexual harassment and/or assault, gender identity, self-esteem, loneliness, substance use and/or abuse, and self-defeating behaviors. Beginning In 2023 the Counseling Center expanded collaboration with an on-line provider, Mantra

Health, to offer additional counseling and mental wellness support resources to all enrolled students, free of charge. The professional staff at Student Health and Counseling also collaborate with other campus team members to enhance the well-being and health of Clarkson students. Mental Health First Aid, which is an 6.5 hour workshop designed to build participants' confidence in identifying individuals struggling with mental health challenges, providing support, and connecting to resources, is coordinated through the Counseling Center. It is made available to students for free.

Health Services

The University has forged a partnership with Rochester Regional Health/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. Most visits to the Student Health Center and many services are free of charge. The Student Health Center is open weekdays from 8 a.m. – 4:30 p.m. during the academic year. After hours care is also available at CPH's Urgent Care Center (49 Lawrence Ave) or the CPH emergency department (50 Leroy Street) located approximately one mile from campus. There is also the option for Virtual Urgent Care through Rochester Regional Health which can be accessed through rochesterregional.org/urgentcare. In after hours emergency situations, students are encouraged to contact 911 and Campus Safety if they need assistance.

Office of Accessibility 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 Accessibility 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 staff of Accessibility Services to review documentation and determine reasonable accommodations. The Office of Accessibility Services will provide instructions to the student for faculty and staff notifications requesting reasonable accommodations. Reasonable accommodations will be provided to eligible students who have followed the procedures as developed by the Office of Accessibility Services. Services may include short-term arrangements for students who have become temporarily disabled.

Student Support & Engagement

Cathy McNamara, Associate Vice President of Academic Support & Student Engagement

Student Success Center

The Student Success Center supports the academic and personal success of all Clarkson students by providing coordinated resources and programs that enhance the student experience. Core offerings include CU Connect Mentoring, First-Year Seminar (FY100), Academic Recovery course, MCAT test prep support, tutoring, academic skills development, and opportunity program support. In partnership with the Office of Information Technology, the Center also manages Slate for Current Students, Clarkson's comprehensive student success platform that integrates advising, communication, and early-alert tools to foster strong connections and help students navigate their academic journey.

First Year Seminar, FY 100

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.

Academic Recovery - UNIV 100

University Skills Seminar is a seminar-style course that is designed as a positive intervention for first and second year students who demonstrated low academic performance and/or were academically separated in the previous fall semester at Clarkson University. The course is meant to facilitate a holistic approach to academic success and foster retention in participating students. Students will use this course to identify their unique barriers that may impede their academic experience and develop an action plan to overcome these barriers. Students will take a deep dive into the resources available at Clarkson and create individualized action plans that outline which specific resources are needed for the student to achieve academic success. This course will place a focus on building the academic skills necessary to be a successful student at Clarkson, focusing on STEM learning, critical analysis and writing skills. The students will develop and apply time management, academic and study skills that are essential to success in higher education. This course is meant to foster autonomous, self-advocating learning and professionals. The course will focus on forming sustainable and healthy habits that will help students not only reach their academic and personal goals, but foster a stronger sense of emotional and mental wellness.

MCAT
MCAT Prep Moodle page: Is intended to help students prioritize self-directed study in preparation for taking the Medical School Admissions Test (MCAT). Organized by the Student Success Center in collaboration with the Health Professions Advising Committee, this resource also provides guidance on MCAT exam strategy and access to specialist faculty who have agreed to assist students with encountered topic areas of difficulty. Additionally, periodic proctored practice MCAT exams are offered to help students hone their skills and identify areas that need improvement.

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. Underrepresented students' mentors are hand selected from over 80 volunteers to mentor students who are strategically placed within our campus community.

Tutoring Services
Clarkson's Tutoring Program provides students with assistance throughout the semester from trained undergraduate tutors. Tutors are Clarkson students who have successfully completed the same courses, offering relatable guidance while helping peers expand their academic networks.

Students can choose between structured Small Group Tutoring or flexible Drop-In options. Students are able to sign up for Small Group Tutoring sessions that meet weekly for 1.25 hours, and are arranged around individual schedules. This format promotes time management and consistency in learning.

Clarkson has three Drop-In Tutoring centers, which are open five days a week in the afternoon and evenings. The tutors in the centers provide assistance with many math, physics, chemistry, and engineering courses.

These services are highly utilized by our students, with many seeking out one or both methods of tutoring assistance.

New York State Arthur O. Eve Higher Education Opportunity Program
Marjorie Warden, Director of HEOP & CUPO

The Clarkson University New York State Arthur O. Eve Higher Education Opportunity Program (HEOP) is funded jointly by the University and a HEOP grant through the New York State Education Department. Clarkson HEOP offers college access and a comprehensive academic support system to assist in student academic success. The program provides a broad range of services to students who, because of academic and economic circumstances, would otherwise be unable to attend a postsecondary educational institution. Clarkson HEOP students have access to a significant student-centered support system, including the Summer Pre-Freshman Experience (SPREE) and academic-year guidance and support.

The Community of Underrepresented Professional Opportunities
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 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
Funded to serve 90, 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 Ronald E. McNair Post Baccalaureate Achievement Program
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.

Career Center
Emily Sheltry, Associate Director of Career Development

The Career Center is a holistic student service that provides connections between students, alumni, and employers as they prepare for their post-graduate career journey. . Our office provides career development and services that include exploration, professional development, experiential education, and employment opportunities. We utilize a holistic comprehensive career readiness educational model that meets students where they are at to help prepare them to make their mark on the globally diverse world.

Fun Facts:

1. 95% of Clarkson graduates who reported are placed in either their field of study, continuing education, or with the military within 6 months of graduation
2. 92% of students participated in an internship, co-op or research to fulfill their professional experience requirement before graduation
3. Over 350 employers visit campus yearly to recruit at Career Fairs and campus interviews
4. All students have access to Handshake, a comprehensive online career resource

Visit and interact with our office early to obtain:

1. A jump start on your career journey- resume, cover letter, interview and networking advice available in one-on-one coaching
2. Targeted student services and resources available to students 24/7 on our website for a customized experience
3. Student professional development through workshops
4. Access to employers and alumni through mock interviews, discovery sessions, hiring events and innovation competitions
5. Assistance with landing internship, co-op, and full-time career experiences.

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

The Career 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: campus recruiting programs 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 online called Handshake; 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 years.

Experiential Education Program

Cooperative Education & Internships Cooperative Education (Co-op) Program
The Career Center works closely with representatives of business, industry and government to connect 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, teaching students how to conduct a successful job search, and professionalism in the workplace. A key decision for the student is how to make up for 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 and does not pay tuition expenses. 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 in 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.

Internship Program
As part of the professional experience component, the Career Center also offers assistance in identifying and applying for internships. 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, internships are offered throughout the year, along with individual advising. Most internships are paid; in some cases, students receive a stipend or receive academic credit.

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.

International Center
The International Center is a hub of activity providing the Clarkson community with a multitude of global opportunities – experiences – and advisement.

Go Abroad
One of the best ways to prepare for the global workforce is to immerse yourself in another culture. The International Center provides students with numerous global experiences, such as: traditional semester/year exchange with many universities around the globe – short-term/faculty-led programs – or – international internships.

Study Abroad provides an excellent opportunity for undergraduate 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 many universities around the world Please see the Clarkson International Center website for a listing of Clarkson's Exchange Partners by Country.

In addition to the semester or year-long exchange opportunities, Clarkson offers students the option to participate in short-term programs or faculty led trips. The short-term 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 while enrolled in a course during the spring semester. The International Center works with all disciplines to ensure all students in all majors that require or want a global experience have the opportunity.

Exchange 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 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 the credit hour and grading system 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.

Work Abroad

Imagine working for an organization or company abroad, and learning what it is like to work in another culture. You will increase your marketability and be better prepared for the global workplace upon graduation. Students interested in an internship abroad can work with the International Center staff to identify the opportunities available across the globe. Some of these jobs are paid and some are for academic credit. Visit the International Center website for more information.

International Student and 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. In addition, International Center staff coordinate services and benefits available to the international population and facilitate international cultural events within the Clarkson community to promote global diversity.

ATHLETICS

Laurel Kane, Director of 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.

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.

Facilities

The Henry R. Hodge Sports and Recreation Complex is located on the Potsdam campus, 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, which is home to The Munter Family Climbing Wall, Steven J. Yianoukos Fitness Center and Hockey Arena.

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. 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/campus-safety .

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 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 Association Leadership Board 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 in 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 fundraising efforts, mentoring undergraduates, serving as speakers on campus, serving on advisory councils, and providing opportunities to learn the value of being engaged alumni. There are nearly 30 regional chapters located in almost every major U.S. city. These regional chapters host approximately 120 events each year to engage alumni and keep them connected to Clarkson.

OFFICE OF INFORMATION TECHNOLOGY

Joshua Fiske, Vice President for Information Technology & Libraries

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 campus IT 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 connect to this network via high-speed wired and wireless connections in buildings across campus. The campus network is connected to the Internet via several multi-gigabit connections.

All students have access to a broad range of computing and information technology resources, including: high-tech, multimedia classrooms and collaborative spaces; email;

web conferencing; digital publishing; online teaching and learning; and campus computer labs equipped with the latest software.

OIT supports Clarkson's commitment to integrating technology into the classroom through its instructional technology operation. Instructional Technology supports both students and faculty by providing and maintaining software, equipment and facilities for the production, dissemination, and utilization of learning resource materials.

Student Personal Computers
Information technology is such an integral part of today's marketplace, it is strongly recommended that every Clarkson student have an appropriate personal computer. 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 found in the academic buildings.

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Robert Frost, Assistant Athletic Trainer
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BS, MS, MSPT, PhD, The University of Western Ontario
Assistant Professor, Physical Therapy

GEARY, Amanda
Juris Doctor, Maurice A. Deane School of Law
BS, Clarkson University
Assistant Professor, Economics & Financial Studies

GREENE, James
BS, The Pennsylvania State University
MS, PhD, University of Maryland
Assistant Professor of Mathematics

GOLIBER, Nikita
BS,MS, Clarkson University
FNP, State University of New York Upstate Medical University
Clinical Assistant Professor, Physician Assistant Studies

GOOD, Tiara
BA, Willamette University
MA, Syracuse University
PhD, The Pennsylvania State University
Assistant Professor of Communication

GUO, Zhujin
MS, PhD, University of Missouri
BA, Southwestern University
Assistant Professor, Economics & Financial Studies

HARRIS, Matthew
BS, University of Evansville
MS, University of Alaska Fairbanks
PhD, University of Waterloo
Assistant Professor of Mathematics

HOOVER, Karen
BS, Ithaca College
MS, Columbia University
OTD, Chatham University
Clinical Assistant Professor / Chair of Occupational Therapy

IMTIAZ, Masudul
BS, MS, University of Dhaka
PhD, University of Alabama
Assistant Professor of Electrical and Computer Engineering

KIM, Taeyoung
BS, PhD, Seoul National University
Assistant Professor of Chemical and Biomolecular Engineering / Institute for a Sustainable Environment

KING, Melissa
BS, Central Connecticut State University
PhD, Wesleyan University
Assistant Professor of Chemistry & Biochemistry

KRAUS, Petra
PhD, University of Ulm
Assistant Professor, Biology

KRULL-GOSS, Krista
Pharm D, Wilkes University
Clinical Assistant Professor, Physician Assistant Studies

LAPOINT, Christopher
BS, Alfred University
Clinical Assistant Professor / Chair of Physician Assistant Studies

LAW-PENROSE, Jared
BA, Messiah College
PhD, Purdue University
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LI, Gangqiang
BS, MS, Zhejiang Ocean University
PhD, Shanghai Jiaotong University
PhD, York University
Assistant Professor of Mechanical and Aerospace Engineering

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Assistant Professor of Chemical and Biomolecular Engineering

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MS, University of Texas at Austin
PhD, Carnegie Mellon University
Assistant Professor, Economics and Financial Studies

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Clinical Assistant Professor, Physician Assistant Studies

MARKO, Moshe
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MHS, Washington University
DPT, Massachusetts General Hospital Institute of Health Professions
PhD, Syracuse University
Clinical Assistant Professor, Physical Therapy

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MS, Clarkson University
Clinical Assistant Professor, Physician Assistant Studies

MARTIN, Jonathan
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PhD, University of Alberta
Assistant Professor of Mathematics

MCCRUM, Ian T
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PhD, The Pennsylvania State University
Assistant Professor of Chemical and Biomolecular Engineering

MELNIKOV, Dmitriy
BS, MS, Moscow Engineering- Physics Institute
PhD, Lehigh University
Assistant Professor of Physics

MEYSAMI, Mohammad
BS, MS, Indiana University
PhD, University of Colorado Denver
Assistant Professor of Mathematics

MOSHTAGH, Mohammad
BSc, K.N. Toosi University of Technology
MSc, University of Tehran
PhD, DeGroote School of Business, McMaster University
Assistant Professor, Engineering and Management Director

PETLEY, Lauren
BSC, Laurentian University
PhD University of Ottawa
Assistant Professor of Psychology

RAAD, Nima Golghamat
BSc, Isfahan University of Technology
MSc, Amirkabir University of Technology
PhD, University of Missouri-Columbia
Assistant Professor, Engineering and Management

RICHARDS, Melissa
AS, Nassau Community College
BS, MS, PhD Clarkson University
Assistant Professor, Institute for STEM Education

SACKS, Michael
BS, Towson University
MA, PhD, University of California, Irvine
Assistant Professor, Economics and Financial Studies

SANDS, Kylie
BS, SUNY Potsdam
MBA, Northcentral University
Clinical Assistant Professor, Physician Assistant Studies

SEKELJ, Gasper
BS, MBA, Clarkson University
Assistant Professor, Economics and Financial Studies

SEO, Jihoon
PhD, BE, Hanyang University
Assistant Professor Chemical and Biomolecular Engineering

SIRSAT, Tushar
MBBS, Maharashtra University of Health Sciences
PhD, University of North Texas
Assistant Professor, Physician Assistant Studies

SOWA, Feimatta
MPH, St. George's University
MD, Latin American American School of Medicine
Clinical Assistant Professor, Physician Assistant Studies

TEPYLO, Nicholas
PhD, M.A.SC., B.ENG., Carleton University and INSA Toulouse
Assistant Professor of Mechanical and Aerospace Engineering

THAPA, Mishal
BS, NUAA, China
MS, PhD, University of Alabama
Assistant Professor of Mechanical and Aerospace Engineering

TOTH, Scott
BS, Shippensburg University
Assistant Professor of Military Science

TRIVEDI, Dhara
BSc, MSc, Gujarat University
MA, PhD, University of Rochester
Assistant Professor of Physics

WANG, Siwen
BS, MS, Tsinghua University
PhD, California Institute of Technology
Assistant Professor of Civil and Environmental Engineering

WANG, Wenting
BA, Beijing Forestry University
MS, PhD, McMaster University
Assistant Professor, Operations and Information Systems

XIAO, Suguang
BS, Chang'an University
MS, Tongji University
PhD, Lehigh University
Assistant Professor of Civil and Environmental Engineering

YOO, Michelle
BS, MS, Seoul National University
PhD, University of Florida
Assistant Professor of Biology

ZEIGLER, Stacey
BS, State University of New York Health Science Center
MS, California College for Health Sciences
DPT, Simmons University
PhD, Clarkson University
Assistant Professor, Director of HealthCare Management

ZHANG, Jianhua
BS, Jimei University
MS, Xiamen University
MS, New Mexico Institute of Mining and Technology
PhD, North Carolina State University

Assistant Professor of Electrical and Computer Engineering

ZHANG, Ying
B.E., Jinan University
MS, Jilin University
PhD, Syracuse University
Assistant Professor of Psychology

Professors of Practice

BACKUS, Erik C.
BS, Clarkson University
MS, University of Missouri- Rolla
PhD, Clarkson University
Professor of Practice of Civil and Environmental Engineering / Director of CEM

BARKER, Philip
Professor of Practice and Distance Power Engineering / MS Program Coordinator, Electrical and Computer Engineering

BUCKINGHAM, Ronald
Professor of Practice in Mechanical and Aerospace Engineering

COMPEAU, Marc
BS, SUNY Potsdam
MS, Clarkson University
Professor of Practice, Consumer & Organizational Studies / Co-Director Reh Center Entrepreneurship

ISSEN, Marshall
BS, University of Illinois, Urbana
MS, Roosevelt University
P.E., Illinois
Professor of Practice, Engineering and Management

OLSEN, William
BA, University of Buffalo
Professor of Practice, Civil and Environmental Engineering

RODRIGUEZ, Luis
PhD, University of Texas at El Paso
Professor of Practice, Mechanical and Aerospace Engineering

Instructors

BROOKSBY, Evan
BS, Brigham Young University
MBA, Union Graduate College
Instructor, Healthcare Management

CONLON, Tyler
Instructor of Operations & Information Systems / Director of Projects & IT Infrastructure
Data Science Program

HUGHES, Cassandra
Instructor, Air Space & Cyberspace Studies

LAROCK, Krista
BS, SUNY Potsdam
MS, MBA, Clarkson University
Instructor, Consumer and Organizational Studies

MARTIN, Christopher
BS, Clarkson University
MS, SUNY Potsdam
Instructor of Mathematics

MORRISON, Sara
BS, St. Lawrence University
MS, University of Vermont
Instructor of Mathematics

SAJNA, Catherine
Instructor / Director of the Writing Center & ESL Program
Center for Excellence in Comm

SULLIBAN, Wylee
Instructor, Military Science

WOZNY, Andrew
Instructor, Military Science

WULTSCH, Elisabeth
Instructor, School of Engineering

POLICIES

Clarkson University Nondiscrimination Statement
Clarkson University does not discriminate on the basis of race, creed, color, religion, sex, sexual orientation, gender, gender identity, gender expression, national or ethnic origin, age, disability, pregnancy-related condition, military or veteran status, genetics, domestic violence victim status, marital status, familial status, ancestry, source of income, relationship or association with a member of a protected category, or other basis protected by applicable local, state, or federal law in provision of educational and 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 ADA504@clarkson.edu.

Inquiries concerning Title IX, Title VI, the Age Discrimination Act, or other discrimination concerns should be directed to Vice President for Access Initiatives, Title VI, Title IX, ADA/504 Coordinator Jennifer Ball at jball@clarkson.edu , ERC 1003A, or 315-268-4208.

Information on the procession of grievances and charges relating to the above policies can be obtained here.

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 600.0, the following resources are provided:

Filing a Grievance with NY State New York State Education Department: Office of College and University Evaluation, Room 960 EBA, 89 Washington Avenue, Albany, New York, 12234. For more information, please visit: http://www.nysed.gov/college-university-evaluation/filing-complaint-about-college-or-university

Online Student Consumer Protection
Clarkson University is a member of the National Council for State Authorization Reciprocity Agreements (NC-SARA) and follows the complaint resolution policies and procedures outlined within the SARA Policy Manual and summarized here. For a list of NC SARA participating states and institutions, you may visit the NC-SARA directory.

Any complaints made regarding grades or student conduct are governed by Clarkson University policy and are not subject to NC-SARA involvement.

Students outside of New York State:
Consumer protection complaints resulting from distance education courses, activities, and operations from students outside of New York State may be submitted to Amanda J. Pickering, Associate Vice President of Academic Affairs & Student Achievement for investigation and resolution. If a student is dissatisfied with the institution-based resolution, a concern may be submitted, within two years of the incident about which the complaint is made, to the New York State Education Department as outlined here.

Students within New York State:
Any complaints made by students residing within New York State are not subject to NC-SARA involvement, and should follow the Grievance Procedures detailed in the Clarkson Student Regulations.

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 and Security, 315-268-6666, or visit https://www.clarkson.edu/student-life/student-support-services/safety-security.

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 Students
Clarkson is authorized under federal law to enroll nonimmigrant students.

Student Regulations
Each student is responsible for knowing the contents of the Clarkson Regulations. The Regulations contain information on registration, class absences, the grading system,

scholastic requirements, the method for removing course deficiencies, special examinations, and the Code of Student Conduct, campus policies, and other information regarding University operations. For a link to the Clarkson student regulations, please visit: https://www.clarkson.edu/admissions-financial-aid/sas/clarkson-regulations

ACADEMIC CALENDAR

The academic calendar contains the dates of major academic events occurring each academic year and serves as an information source and planning tool for students, faculty, staff, families, and outside organizations. The academic calendar is published once a year, and is subject to change at any time.

Undergraduate Programs

	2025-2026	2026-2027
Fall Semester Events	**Fall 2025**	**Fall 2026**
New Student Move-in*	22 August	21-21 August
Returning Student Move-In*	23-24 August	22-23 August
Classes Begin	25 August	24 August
Career Fair	17 September	TBA
Fall Recess	13-14 October	12-13 October
Classes Resume & Midterm grades due	15 October	14 October
Family Weekend Begins	31 Oct-2 November	TBA
Enrollment For Spring Classes Begin	5 November	4 November
Thanksgiving Recess	26-28 November	25-27 November
Classes Resume	1 December	November 30
Last Day of Class	5 December	4 December
Final Exams	8-12 Dec	7-11 Dec
Fall Graduates Recognition Ceremony	13 December	12 December
Final Grades Due at 9:00am	15 December	14 December

	2025-2026	2026-2027
Spring Semester Events	**Spring 2026**	**Spring 2027**
New Student Move-In	6January	5 January
Returning Student Move-In	7 January	6 January
Classes Begin	8 January	7 January
Career Fair	TBD	TBA
February Break	19-20 February	18-19 February
Classes Resume	23 February	22 February
Midterm Grades Due	2 March	1 March
Spring Recess	16-20 March	15-19 March
Classes Resume	23 March	22 March
Enrollment For Fall Classes Begin	1 April	30 March
Last Day of Class	24 April	23 April
Reading Days	27-28 April	26-27 April
Final Exams	29 April -5 May	28 Apr-4 May
Final Grades Due at 9:00am	8 May	7 May
Undergraduate Commencement Ceremony	9 May	8 May

Summer Semester Events	2025-26	2026-2027
10 Week Session	**Summer 2026**	**Summer 2027**
Classes Begin	18 May	June 7
Classes End	July 31	August 6
Grades Due	4 August	16 August
First 5 Week Session	**Summer 2026**	**Summer 2027**
Classes Begin	18 May	7 June
Classes End	19 June	9 July
Grades Due	23 June	12 July
Second 5 Week Session	**Summer 2026**	**Summer 2027**
Classes Begin	29 June	12 July
Classes End	July 31	13 August
Grades Due	4 August	16 August
Alumni Reunion	TBD July	TBD July

DEGREE PROGRAMS AND 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

David D. Reh School of Business Bachelor of Science	**Hegis Code**
Business Administration	0501
Business Analytics	0503
Engineering and Management	4904
Financial Information and Analysis	0504
Global Supply Chain Management	0509
Innovation and Entrepreneurship	0506
Wallace H. Coulter School of Engineering & Applied Sciences Bachelor of Science	
Aerospace Engineering	0902
Applied Mathematics and Statistics	1703
Biochemistry	0499
Chemical Engineering	0906
Chemistry	1905
Civil Engineering	0908
Computer Engineering	0999
Computer Science	0701
Data Science	1703
Electrical Engineering	0909
Environmental Engineering	0922
Mathematics	1701
Mechanical Engineering	0910

Physics	1902
Signature Teachout Bachelor of Science Programs	
Communication	0601
Digital Arts and Sciences	0605
History	2205
Literature	1501
Interdisciplinary Liberal Studies	4901
Interdisciplinary Social Sciences	2201
Political Science	2207
Sociology	2208

Lewis School of Health & Life Sciences Bachelor of Science	
Biology	0401
Business of Biotechnology	0499
Healthcare	1201
Healthcare Business	1202
Psychology	2001

Institute for a Sustainable Environment (ISE) Bachelor of Science	
Environmental Science and Sustainability	0420
Interdisciplinary Bachelor of Science	
Software Engineering	0999
Bachelor of Professional Studies	
Individually Designed Program	4999