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

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

The University also includes The Capital Region Campus for graduate education in Schenectady, New York, and The Beacon Institute for Rivers and Estuaries for environmental research and education in Beacon, 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 Web site, but as courses and curricula undergo changes by official action of the University, occasionally such changes may supersede information found herein. The accuracy of any particular information can be checked through The Graduate School, Student Administrative Services, the Dean of the appropriate School, or academic departments.

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

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

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

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 David D. Reh School of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB), and 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 has been granted Candidacy Status by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA). Clarkson University is currently pursuing accreditation of its educator preparation programs by the Association for Advancing Quality in Educator Preparation (AAQEP). Pursuant to §52.21 of the Regulations of the Commissioner of Education, the educator preparation programs offered by Clarkson University are considered to be continuously accredited for purposes of meeting the New York State requirement that all such programs maintain continuous accreditation. In addition, the University is accredited by the United States Civil Service Commission, and its curricula are approved by the New York State Board of Regents. All Clarkson degree programs are approved by the New York State Division of Veterans Affairs for the training of veterans and other eligible persons.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADUATE ADMISSIONS</td>
<td>4</td>
</tr>
<tr>
<td>A BRIEF HISTORY OF CLARKSON</td>
<td>5</td>
</tr>
<tr>
<td>GRADUATE DEGREE AND ADVANCED CERTIFICATE PROGRAMS</td>
<td>8</td>
</tr>
<tr>
<td>THE GRADUATE SCHOOL</td>
<td></td>
</tr>
<tr>
<td> Graduate School Admissions</td>
<td>9</td>
</tr>
<tr>
<td> International Applicant Language Verification Requirements</td>
<td>10</td>
</tr>
<tr>
<td> Degree Requirements and Academic Policies for Graduate Students</td>
<td>11</td>
</tr>
<tr>
<td> Grading System</td>
<td>15</td>
</tr>
<tr>
<td> Graduate Student Academic Standing and Separation Policy</td>
<td>17</td>
</tr>
<tr>
<td> Graduate Student Degree Conferral and Commencement Policies</td>
<td>19</td>
</tr>
<tr>
<td> Commencement Participation Policy</td>
<td>20</td>
</tr>
<tr>
<td> Expenses, Financial Assistance, Student Status</td>
<td>21</td>
</tr>
<tr>
<td>THE ASSOCIATED COLLEGES CONSORTIUM</td>
<td>28</td>
</tr>
<tr>
<td>STUDENT AFFAIRS</td>
<td>30</td>
</tr>
<tr>
<td>CLARKSON ALUMNI ASSOCIATION</td>
<td>35</td>
</tr>
<tr>
<td>ATHLETICS</td>
<td>36</td>
</tr>
<tr>
<td>INFORMATION TECHNOLOGY</td>
<td>36</td>
</tr>
<tr>
<td>UNIVERSITY LIBRARIES</td>
<td>37</td>
</tr>
<tr>
<td>SCHOOL OF ARTS &amp; SCIENCES</td>
<td>38</td>
</tr>
<tr>
<td>THE DAVID D. REH SCHOOL OF BUSINESS</td>
<td>52</td>
</tr>
<tr>
<td>WALLACE H. COULTER SCHOOL OF ENGINEERING</td>
<td>70</td>
</tr>
<tr>
<td>INSTITUTE FOR A SUSTAINABLE ENVIRONMENT</td>
<td>102</td>
</tr>
<tr>
<td>INSTITUTE FOR STEM EDUCATION AND DEPARTMENT OF EDUCATION</td>
<td>106</td>
</tr>
<tr>
<td>PROGRAMS IN HEALTH PROFESSIONS</td>
<td>110</td>
</tr>
<tr>
<td>INTERDISCIPLINARY PROGRAMS</td>
<td>130</td>
</tr>
<tr>
<td>SPONSORED RESEARCH SERVICES</td>
<td>145</td>
</tr>
<tr>
<td>ACADEMIC CENTERS</td>
<td>146</td>
</tr>
<tr>
<td>THE REGISTER BOARD OF TRUSTEES</td>
<td>153</td>
</tr>
<tr>
<td>ADMINISTRATION</td>
<td>155</td>
</tr>
<tr>
<td>FACULTY DIRECTORY</td>
<td>164</td>
</tr>
<tr>
<td>ACADEMIC CALENDARS</td>
<td>181</td>
</tr>
<tr>
<td>POLICIES</td>
<td>184</td>
</tr>
<tr>
<td>LIST OF GRADUATE PROGRAMS/CERTIFICATES &amp; HEGIS CODES</td>
<td>186</td>
</tr>
</tbody>
</table>
GRADUATE ADMISSIONS

Clarkson Potsdam Campus
315-268-6400

Capital Region Campus
518-631-9931

School of Arts & Sciences Programs
315-268-3802
E-mail sciencegrad@clarkson.edu

David D. Reh School of Business Programs
315-268-6613
E-mail busgrad@clarkson.edu

Wallace H. Coulter School of Engineering Programs
315-268-7929
E-mail enggrad@clarkson.edu

Institute for a Sustainable Environment (ISE) Programs
315-268-3856
E-mail ise@clarkson.edu

Institute for STEM Education
315-268-6544
E-mail csmith@clarkson.edu

Physician Assistant Studies Program
315-268-6418
E-mail ndominy@clarkson.edu

Physical Therapy Program
315-268-4352
E-mail lhayes@clarkson.edu

Occupational Therapy Program
315-268-4412
E-mail ot@clarkson.edu
A Brief History of Clarkson
(The following summary has been excerpted largely from A Clarkson Mosaic, a history written by Professor Emeritus Bradford B. Broughton in conjunction with the institution’s 1996 Centennial.)

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

Choosing as their rationale a phrase which his sisters and nieces felt aptly described their brother—Thomas’ favorite Biblical quotation, A workman that needeth not to be ashamed—the family opened the Thomas S. Clarkson Memorial School of Technology in September 1896, in The Main Building (“Old Main”) which they commissioned to be built on Main Street. To the five young men in the preparatory class, eight men and four women in the freshman class, six courses of instruction were offered: electrical engineering, domestic science, art, machine work and smithing, woodwork and pattern making, and normal manual training. By 1907 the school was offering additional bachelor’s degrees in mechanical, civil and chemical engineering.

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

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

Hockey began in 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 the added recreational facilities of the Indoor Recreation Center in 1980. The downtown campus also witnessed expansion during those years; Peyton Hall for chemical engineering, Damon Hall for civil, Clarkson Hall for electrical, and Lewis House for a student union. Clarkson also gradually took over Snell Hall from SUNY Potsdam for classrooms and office space.

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

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

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

In 2016, the University welcomed a Graduate School campus in Schenectady, New York that takes advantage of all that New York’s Capital Region has to offer. Like Potsdam, Schenectady has a large collegiate presence (Union College and Schenectady Community College in the same city) as well as many other educational institutions, research institutes and government think tanks.
And finally, the cornerstone of Clarkson’s ecosystem is the innovation hub. The proliferation of innovation spaces in higher education is evident in Clarkson’s approach with powerful intentions to fast-track innovation with impact at the intersections of disciplines. Building from our foundation of technology innovation, our competitive advantage is a University-wide environment that sparks intellectual curiosity and replicates real-world connections that students will make when they graduate. Recent renovations to the Andrew S. Schuler Educational Resources Center, Studio Space in Bertrand H. Snell Hall, and downtown incubators located in Peyton Hall, Old Main, and Damon Hall currently provide physical space in support of Clarkson’s plan for producing graduates that can make connections across disciplines to create extraordinary economic and social value.
GRADUATE DEGREE AND ADVANCED CERTIFICATE PROGRAMS

The Higher Education General Information Survey (HEGIS) code designated by the New York State Education Department for classifying these academic programs may be found in the list of degree programs and HEGIS Codes near the end of the catalog. Clarkson University offers the following:

Adolescence Education 7-12 MAT
Basic Science MS
Bioethics MS
Business Administration MBA
Business of Energy, MS
Chemical Engineering MS, ME, PhD
Chemistry MS, PhD
Civil & Environmental Engineering MS, ME, PhD
Computer Science MS, PhD
Data Analytics MS
Electrical and Computer Engineering PhD
Electrical Engineering ME, MS
Energy Systems, MS
Engineering and Management Systems MS
Engineering Management MS
Engineering Science MS, PhD
Environmental Politics & Governance MS
Environmental Science & Engineering MS, PhD
Healthcare Data Analytics MS
Healthcare Management MBA
Interdisciplinary Bioscience & Biotechnology MS, PhD
Leadership in Medicine- Clinical Leadership in Healthcare Management, MS
Leadership in Medicine-Healthcare Management, MBA
Materials Science & Engineering PhD
Mathematics MS, PhD
Mechanical Engineering ME, MS, PhD
Occupational Therapy MS
Physical Therapy DPT
Physician Assistant Studies MS
Physics MS, PhD
Teaching English to Speakers of Other Languages MAT
Technology Education K-12 MAT

Bioethics Certificate
Business Fundamentals Certificate
Business of Energy Certificate
Construction Engineering Management Certificate
Global Supply Chain Management Certificate
Power Systems Engineering Certificate
Teaching English to Speakers of Other Languages Certificate
Healthcare Management Certificate
Human Resource Management Certificate
Management and Leadership Certificate
Graduate School Admissions
Admissions to graduate study is on a merit basis. Evidence of intellectual achievement, motivation, and aptitude are required for admission to graduate programs. Prospective Clarkson graduate students must have or be a candidate for an undergraduate degree from an accredited college before applying for graduate admission status, excluding students applying through specific, official, joint program agreements. Candidates for joint programs should contact a member of the Graduate Admissions Team regarding requirements for admissions. Application materials may include: resume, personal statement, transcripts, test scores, and letters of recommendation. Please contact the appropriate Graduate Coordinator for details on the program’s specific set of requirements. Non-engineering majors may do engineering graduate work, but the degree they receive may not make them eligible to sit for the professional engineering licensing examinations immediately upon graduation.

Applicants for all graduate programs in science, engineering and interdisciplinary programs are required to take the Graduate Record Examinations; some programs including the David D. Reh School of Business will also accept the GMAT score.

All admission decisions must be approved by the applicant’s departmental graduate representative, by the director of the program and/or the dean of the appropriate school. While there is a rolling admission policy, and all applications will be reviewed up to a reasonable time prior to the beginning of classes, it is recommended that students requesting financial aid apply by January 30 for the fall term and September 1 for the spring term. Students are encouraged to apply no later than five (5) months prior to the preferred term of entry to allow time for admissions processes. For students applying to the one-year MAT program that begins in the summer, complete applications must be received no later than April 1st. For students applying for the two-year MAT program that begins in the Fall term, applications are due by June 1st. For applications and other inquiries about the status of an application, contact the specific department of interest or see Clarkson’s Web site at http://graduate.clarkson.edu/

Admission Graduate School Policy for Current Undergraduate Clarkson Students
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 prior to baccalaureate graduation. These students may accelerate their undergraduate course of study to graduate early and begin their graduate work as soon as possible. Please contact the specific program for further instructions. Superior Clarkson undergraduate students, with the permission of their department chair and the dean of the appropriate School, may enroll in business, engineering, science, and information technology graduate courses. When such courses are completed with a grade of C or better beyond the normal credit hour requirements for the bachelor’s degree, credit may be applied toward a graduate degree.

International Applicants: Language Verification 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 issue of an I-20. Once the university has verified this requirement, and the applicant is accepted, the I-20 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](http://www.toefl.org))
- IELTS (International English Language Testing System: [http://www.ielts.org](http://www.ielts.org))

Graduate international student admissions, in all programs (excluding DPT, MS in PAS, MS in OT, and education MAT) require a minimum IBT TOEFL score of 80 or minimum IELTS band score of 6.5. A TOEFL/IELTS 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 official language. Students in graduate programs leading to professional certification/licensure also may have a requirement relating to language verification requirements as defined in their field. Details are in the handbooks for these programs. Additionally, a program may request a World Education Services (WES) evaluation be submitted by the applicant.

Lastly, all matriculated international students for whom English is a second language are required to complete the ESL placement exam upon arrival to campus and complete any resulting requirements. Waivers to the requirement of the ESL placement exam will be determined at the program level by the appropriate designated administrator(s) who may consider documented exceptions based on reasonable student experience and/or prior education. Any language courses required as a result of the placement exam are not counted toward degree requirements. Applications to the MAT program may be required to complete an additional English language proficiency interview.
Degree Requirements and Academic Policies for Graduate Students

Requirements for the Master’s Degree

Note: This section does not apply to students in Clarkson’s Health Sciences Programs (MS in Physician Assistant Studies and MS in Occupational Therapy) or to the Masters of Arts in Teaching. Students in these degree programs should refer to the program sections of this catalog for degree requirements. The minimum graduation requirements for students in Master’s degree programs at Clarkson are listed below. Additional graduation requirements are set by each degree program. Consult the department office for details.

1. A minimum of 30 credit hours of graduate coursework, as follows. a. At least 20 credit hours of course and seminar work. The balance of coursework must be consistent with the research or professional experience component.
   b. Only courses numbered 500 and above are accepted for graduate credit.
   c. 10 credit hours of transfer credit (B grade or better) may be accepted, or with the Dean of The Graduate School’s approval, a maximum of 12 credit hours of transfer credit from a post-baccalaureate certificate program (B grade or better) may be accepted.

2. Satisfactory completion of one of the research or professional experience components listed below. Please note all options may not be available in every program.
   a. A written thesis based on independent research;
      A thesis submitted in partial fulfillment of the requirements for the Master of Science degree will be examined by a committee of at least three Clarkson faculty appointed by the student’s department. After approval by the examining committee, a thesis requires signature approval by the Dean of the Graduate School, and two copies of the thesis will be deposited in the University library.
   b. A comprehensive examination;
      A comprehensive examination taken in partial fulfillment of the requirements for the Master of Science degree will be administered by a faculty member or faculty committee approved by the appropriate academic administrator.
   c. An appropriate, professionally oriented special project
      A project submitted in partial fulfillment of the requirements for the Master of Science degree will be examined by a faculty member, or faculty-member committee, as approved by the appropriate academic administrator.

3. At least one academic year of study beyond the B.S.

4. A cumulative GPA of 3.0 in courses used to meet graduation requirements

5. All work must be completed in five calendar years. Former Union Graduate College students active in their respective programs prior to summer quarter 2016 must complete in six calendar years.
Requirements for the Doctoral Degree
The minimum requirements for all students in Doctor of Philosophy (PhD) degree programs are described below. Please consult your departmental office for additional requirements.

1. A minimum of 90 credit hours, as follows.
   a. A minimum of 24 credit hours coursework.
   b. A minimum of nine course credit hours taken in residence (includes distance learning courses offered by Clarkson University).
   c. A minimum of six credit hours of seminar.
   d. A maximum of 30 credits transferred from an MS degree towards PhD degree requirements (B grade or better).

2. A minimum of three academic years of full-time graduate study or the equivalent in part-time study. Two years of study must be in residence at Clarkson. Students matriculated in the off-campus PhD program are exempt from this residency requirement (see below).

3. Satisfactory completion of the PhD comprehensive examination for admission to candidacy (“candidacy procedure”) within two years of full-time study after admission to the PhD program or, for part-time students, before completing 66 credits (see below)
   a. After completion of the candidacy procedure, the student will be identified as a “PhD Candidate.”
   b. Students who fail the candidacy procedure may make a second attempt according to department guidelines.
   c. A student who does not successfully complete the candidacy procedure within the time allowed may be dropped from the graduate program.

4. A written dissertation must be submitted by each candidate and defended orally as part of the final examination (see below).

Requirements for students enrolled in the Doctor of Physical Therapy (DPT) program vary from those outlined here and are described in the General Requirements for DPT Curriculum.
Any changes in the student’s degree program must be approved by the Academic Standards Committee.

Off-Campus PhD Program Policy
The off-campus PhD program has been designed to allow Clarkson University doctoral degree candidates to conduct their dissertation research at their employer’s research facilities. A Clarkson faculty advisor directs the dissertation research with the assistance of a co-advisor at the student’s employer, and up to 50% of required coursework can be taken from Clarkson via online and distance learning.

1. The minimum-credit-hour requirement after the bachelor’s degree is 90 hours (current requirements). The normal course requirements for the student’s department and the University must be met. Students may take up to 50% of required coursework through distance learning. Students who enter the program with an MS degree may transfer up to 30 credits toward the PhD from their master's program.

2. The student must satisfy all the entrance requirements of the academic department. This is beyond the basic University requirements already in place for admission to the PhD program. The
experience and specialization of each candidate will be considered in the admission evaluation process.

3. It is essential that the dissertation committee includes one qualified representative from the student’s employer. The representative will act as a co-advisor within the organization. Each department will decide if the representative should be appointed as an external committee member of the student’s PhD Committee.

4. The student must fulfill all degree requirements according to each department’s policy. It is considered essential that each candidate is carefully examined for both the depth and breadth of their knowledge in the chosen field of study.

5. The dissertation should be defended at Clarkson University in the normal manner and according to the University and department requirements and regulations. The candidate must demonstrate a sufficient fundamental knowledge in their field.

6. The department will specify the period of time the student spends on campus (at the department) and the number of visits (each semester).

7. The maximum duration of time allowed to finish the dissertation is eight years.

8. The relationship between the student’s employing organization and Clarkson University must conform to the Clarkson Conflict of Interest Policy.

A listing of courses available through distance learning is published each semester. Off campus PhD students may choose from that list and enroll in those courses. These courses shall meet the matriculation requirements set forth in the University course catalog.

The courses for this program will be delivered using a video conference/classroom facility or through the internet. Graduate classes that include off-campus students are scheduled at a video conference facility at Clarkson. An appropriate faculty member is assigned to oversee the courses, coordinate the examinations and evaluation of the student’s performance. Courses may also be given through other means of delivery, provided they meet the University and department requirements. These courses shall meet the matriculation requirements set forth in the University catalog.

**Comprehensive Examination for Admission to Candidacy**

A comprehensive examination based on general preparation in the major field must be taken within two years after admission to the PhD program. If the comprehensive examination is failed twice, the student will be dropped.

**Time Limit**

After the comprehensive examination is passed; all work done specifically for the doctorate is to be completed within a period of seven calendar years.

**Final Examination**

A final examination must be passed. This examination will include, as a minimum, an oral examination based on the dissertation. For the final oral examination, a committee will be selected by the faculty advisor and approved by the department chair and dean of the respective school. The committee will consist of a minimum of five members. The members should include at least four Clarkson faculty of assistant professor rank or higher and possessing an earned doctoral degree. At least one of the members must be from a department other than the candidate’s major department.
With the approval of the Provost, an external examiner with appropriate credentials from another University or industry may also be appointed to serve as one of the five committee members. This committee will judge the technical competence of the dissertation and the oral presentation. Final completion paperwork and an electronic copy of the accepted dissertation (on CD) must be received in the student’s School office no later than 10 working days before commencement to confer degrees to qualify a student to receive a degree at the end of the spring semester. Before final submission of the PhD dissertation, each student will be responsible for submitting their dissertation for publication, and paying any associated fees.*

*For information and assistance, contact the Graduate Coordinator in your school's office.
GRADING SYSTEM
The grades A+, A, A-, B+, B, B-, C+, C, and P are acceptable for credit toward the degree. For graduation an average of B or better must be earned in non-dissertation courses and seminar work. The grade of P will not affect the average. Students failing to perform satisfactorily will be separated from the University (see Graduate Student Academic Standing & Separation Policy).

Graduate Grade Definitions
A+ Passed with 4.000 quality points per credit hour
A Passed with 4.000 quality points per credit hour
A- Passed with a 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 Lowest passing grade with 2.000 quality points per credit hour
F Failed with 0.000 quality points per credit hour
P Passing: this grade may be employed for seminar courses and other courses for which P/NC grading has been designated. It may also be employed for special projects, and under limited circumstances for MS thesis credits. Approval for a P grade for project or thesis credit requires the approval of the department chair, (or comparable administrative unit), Dean of the school, and the Dean of the Graduate School or Provost.
NC No credit. This grade is used in seminar courses and other cases for which P/NC grading has been designated. It indicates performance below the level required to maintain progress toward completion of degree requirements.
S Satisfactory progress towards the completion of on-going project, thesis, or dissertation work for the semester. The S grade is removed and replaced with a P grade when the final report, thesis or dissertation is accepted by the Graduate School.
U Unsatisfactory progress towards the completion of on-going project, thesis, or dissertation work for the semester. The U grade is removed and replaced with a P grade when the final report, thesis or dissertation is accepted by the Graduate School.
I Incomplete grade: given only in cases described in the paragraph below. An I grade must be replaced by one of the above letter grades as required by the rules in the paragraph below.
Z Course Audit. Audited courses carry no grade points or credits, and cannot be used to satisfy degree requirements.
W Course withdrawal. A grade of W indicates the course was dropped during weeks 5 through 10 of the regular fall and spring semesters. The Registrar sets comparable dates for Summer school and other terms that are not a regular fall and spring semester.
LW Late Course Withdrawal. A grade of LW indicates the course was dropped during weeks 10 through 15 of the regular fall and spring semesters. The Registrar sets comparable dates for Summer school and other terms that are not a regular fall and spring semester.
WA Waived Course with credits
WR Waived with replacement, no credit or quality points
Incomplete Grades

- A student who is unable to complete the requirements of a course because of extenuating circumstances may seek an incomplete grade (I) for the course. Whether an "I" grade is given is entirely at the discretion of the faculty member for the course, although the faculty member may ask the Dean of Students' Office if it has relevant information regarding students' requests. The conferring of an "I" grade carries the presumption that it is possible for the course to be completed with a passing grade; in cases where the missing work is such that it cannot be completed after the end of the term, or where completion of the missing work could not possibly result in a passing grade for the course, an "I" grade should not be given.

- Requests for an "I" grade shall be made on a form available from Student Administrative Services. Faculty members indicate on the form whether they approve or disapprove the "I" grade request for their course(s) and return the completed form to Student Administrative Services. If the faculty member approves the request, he or she lists on the form the work that must be completed to remove the "I" grade and the due date for this work and submits an "I" for the student on the course grade roster. If the faculty member disapproves the request, he or she submits a letter grade for the student on the course grade roster.

- Unless otherwise stated on the form, or if no form is received, the work required to remove an "I" grade must be completed no later than the end of the 7th week of classes of the next term in which the student registers at the University, otherwise a grade of "F" is recorded. All requests for "I" grades by a student in the same term shall be made on a single form, and students seeking more than two "I" grades in the same term must consult with the Dean of Students prior to seeking faculty approval for their requests.

- To remove an "I" grade, the instructor shall submit a completed Change of Grade form to the instructor's department chair (or comparable administrative officer), and upon approval, it is sent to Student Administrative Services. The specified grade shall replace the "I" grade in the term(s) in which the student registered for the course.
Graduate Student Academic Standing and Separation Policy

Note: This section applies to students in graduate Business, Engineering, and Interdisciplinary programs. Students in other degree programs should consult their program handbooks for the policy and procedures regarding academic standing and separation.

Clarkson graduate students are regarded as in “academic good standing” if they satisfy two conditions:

1. A minimum Cumulative Grade Point Average (GPA) and,
2. Satisfactory progress toward the degree.

Minimum Cumulative GPA Standards

1. Academic good standing: Students are in academic good standing if they have a minimum 3.000 cumulative GPA. The cumulative GPA is calculated at the end of each term.
2. Academic warning: Students in good academic standing whose cumulative GPA falls below a 3.000 will be placed on academic warning. Students on academic warning whose cumulative GPA is 3.000 or higher at the end of their next term will return to academic good standing.
3. Academic separation: Students on academic warning whose cumulative GPA is below a 2.700 at the end of their next term will be separated from the University, and this separation will be recorded on the official transcript.

Academic standing status for past terms is not modified based on future GPA changes due to courses being repeated or omitted from the cumulative GPA.

Continuance

Students who are separated from the University by the process described above, may not enroll in future terms until so approved by the Graduate School’s Readmission and Continuance Committee. Appeals to this committee for continuance must be made in writing by the student, following the guidelines and deadlines set forth in the Notice of Academic Separation sent to the student. The decision must be given to the student and the Registrar within the published time frame. If continued, students are placed on academic warning for the term into which they are continued.

Satisfactory Progress

In addition, graduate students are required to maintain satisfactory academic progress. In order to maintain satisfactory academic progress, students must be able to complete their degree within the published maximum timeframe allowed for that particular degree. Multiple factors determine this: the courses and other academic requirements remaining to complete the degree program, the time remaining to complete these, other program/degree requirements, and the mathematical possibility of achieving the 3.000 cumulative GPA required for graduation. Academic progress is evaluated at the end of each term by the appropriate Graduate Coordinator and Program Administrator(s):

- Students who are determined not to be maintaining satisfactory academic progress will be separated from the University.
- Thesis-based students who have completed all coursework and receive two consecutive terms of unsatisfactory progress may be dismissed following evaluation by the Graduate School’s evaluation committee.
The designated responsible administrator shall notify the students and the Registrar of separations within 5 business days of the decision. Separation will be recorded on the official transcript.

**Academic Standing and Separation Policy for Graduate Health Sciences**

Academic Standing and Separation Policy for Graduate Health Sciences programs (MS in Occupational Therapy, DPT in Physical Therapy, MS Physician Assistant Studies): Academic standing in the Graduate Professional Health Sciences programs at Clarkson University encompasses academic course work, clinical skills, and professional behaviors. Clarkson University graduate students in the Professional Health Sciences program are regarded in “academic good standing” if they satisfy the following conditions:

1. A minimum cumulative Grade Point Average (GPA) AND satisfactory progress toward the degree.

2. Minimum cumulative GPA standards
   a. Academic Good Standing - Students are in Academic Good Standing if they have a minimum 3.000 cumulative GPA. The cumulative GPA is calculated at the end of each term.
   b. Academic Warning - Students in good academic standing whose cumulative GPA falls below 3.000 will be placed on academic warning. Students may also be placed on academic warning for not meeting department professional behavior standards. Students on academic warning whose cumulative GPA is 3.000 or higher at the end of their next term will return to academic good standing.
   c. Academic Separation - Students will be separated from the University for any one or more of the following:
      i. The student is on academic warning and has a cumulative GPA below 2.700 at the end of the term following initial placement on academic warning will be separated from the University.
      ii. The student receives a grade below a C in any course.
      1. Students in the Physician Assistant Studies program may receive a grade below a C on one full-time clinical education course. However, in this case, students must petition the department to continue in the program and will need to retake that full-time clinical education course.
      iii. The student receives a grade of No Credit (NC) in a full time or integrated clinical education course.
      iv. The student demonstrates professional behaviors that violate the profession’s code of ethics.
      v. The student is on academic warning for more than a total of 2 semesters.
      vi. The student withdraws from a course because he/she will not be able to satisfactorily pass the course
      vii. Not meeting Satisfactory Academic Progress, see section 3

3. Satisfactory Academic Progress
   a. Graduate health science students are required to maintain Satisfactory Academic Progress. In order to maintain satisfactory academic progress, students must be able
to complete their degree within the published maximum timeframe allowed for that particular degree. Multiple factors determine this: professional behavior standards of the programs, safety with clinical skills, the courses and other academic requirements remaining to complete the degree program, the time remaining to complete these, other program/degree requirements, and the feasibility of achieving the 3.000 cumulative GPA required for graduation.

b. Students in the Physician Assistant Studies program must have a cumulative GPA of 3.000 at the end of the didactic portion of the curriculum to proceed to clinical internships.

4. Continuance: Academic progress is evaluated at the end of each term and/or course by the appropriate program faculty. Students are notified as to their Academic Standing within 5 business days of completion of the semester or course by the appropriate department:
   a. Students who are determined not to be meeting minimum GPA requirements or not maintaining satisfactory academic progress will be separated from the University. Students and the Registrar will be notified within 5 business days of completion of the academic term or course by the appropriate department. Students who are separated from the University by the process described above may not enroll in future terms.
   b. Appeal: Students who are separated from the University may appeal the decision in writing to the Graduate School’s Readmission and Continuance Committee within 3 business days of receiving notification of separation from the University. For students in the professional health sciences programs the committee shall consist of the Dean or Associate Dean of Arts and Sciences or Dean of Students (or his/her designee), and one faculty member from each of the graduate professional Health Science programs. The chair of the program in which the student was enrolled will serve on the committee to provide information, but will not be a voting member. The committee will review all appropriate information and provide a decision to the student regarding the appeal within 5 business days of receipt of the appeal. If allowed to continue in the program, the student is placed on academic warning for the term into which they are continued and may need to develop an approved action plan to support their academic progress in subsequent terms.
   c. Academic standing status for past terms is not modified based on future GPA changes due to courses being repeated or omitted from the cumulative GPA.

**Graduate Student Degree Conferral and Commencement Policies**

In order for a graduate student to have their degree conferred,

- All coursework and seminar credits must be completed as specified by the degree requirements.
- Master’s theses or Doctoral dissertations must be approved by the student’s research committee, department, school, and Dean of the Graduate School. All associated final and signed copies and paperwork must be submitted to the appropriate school office by the published deadline. This deadline is generally 10 working days before commencement.
- Projects for non-thesis Master’s students must be approved by the advisor and department. All associated paperwork must be submitted to the appropriate school office by the
published deadline. This deadline is generally two working days before the faculty vote on degree candidates.

Students who do not meet these requirements and deadlines may be considered a conditional degree candidate if:

- They are in the CUSB MBA program at Clarkson and are registered for up to three hours of coursework in the Clarkson international summer program, OR
- They are enrolled in the Doctor of Physical Therapy program for the final three hours of coursework that is not complete at the time of the faculty vote.

Requests for conditional degree status must be approved by the dean of the appropriate school or comparable unit administrator and submitted to the Dean of the Graduate School at least 10 working days before the faculty vote on degree candidates.

For students voted “on condition,” the degree will be conferred when the respective School receives a final grade for the remaining course(s), as appropriate. All conditions for graduation must be met prior to the reporting of graduates to the New York State Education Department; otherwise degrees will be conferred in the next semi-annual commencement ceremony.

**Commencement Participation Policy**

A student may participate in commencement if the student is in good academic standing and:

The student has defended his or her dissertation, thesis or presented their project, yet has failed to meet the published deadline for the final signed copies and completed paperwork, OR

- The student is in a research based Master’s degree program, has submitted an approved and signed thesis or project report, and requires no more than six (6) additional credits of coursework, OR
- The student is in a course-based or project-based Master’s degree program and is within six (6) credits of completing their degree, OR
- The student has completed all required classroom work and has Clarkson educational commitments that would preclude being on campus for the next scheduled graduation ceremony.

Student requests to participate in the graduation ceremony require explicit approval by their Dean or Institute Director, with the approved request submitted to the Dean of the Graduate School at least 10 working days before the faculty votes to confer degrees at commencement.

In the case of an incomplete dissertation, thesis or project, the petition must be initiated by the thesis or project advisor and be approved by the department or program chair, and the dean of the respective school or comparable unit administrator. This petition should (a) certify that a successful presentation or defense of thesis had occurred prior to the published deadlines, and (b) carry the signatures of the thesis or project advisor, and all other members of the thesis examining committee indicating that they are confident that the remaining corrections to the thesis or dissertation can be completed by the student.

Students who are allowed to participate in the graduation ceremony under these conditions will receive their diploma and be counted as graduates at the next graduation ceremony following the completion of their degree requirement.
Expenses, Financial Assistance, Student Status

Expenses
Tuition and other charges at Clarkson are set at the minimum permissible for financially responsible operation and are considerably less than actual costs. Gifts and grants received through the generosity of alumni, industry, foundations, and friends play an important part in reducing the difference. Although Clarkson will make every effort to maintain charges at current levels, the University reserves the right to revise or change financial requirements.

Tuition and Fees
Tuition costs for 2017-2018 graduate programs vary and are charged per credit hour basis. Residential program graduate students are subject to a Residential Program Health, Wellness & Recreation Facilities Fee each term and Non-Residential program graduate students are subject to a Non-Residential Program Resource Fee each term as defined below.

In order to remain a candidate for a graduate degree, a graduate student not on campus who has not completed all degree requirements must continue to register for one credit hour each semester until all degree requirements have been completed. These students are not required to pay a Residential Program Health, Wellness & Recreation Fee or a Non-Residential Program Resource Fee, but may be required to begin re-payment of outstanding loans. Exception from payment of the tuition for this credit hour may be granted to the student (when circumstances warrant) by the dean of the respective school upon written request or personal interview.

University Graduate Program Charges
The summary of annual fixed University charges for the 2017-2018 academic year follows:

**Per Credit Hour/Program Type**
- $1,556  Interdisciplinary
- $1,345  School of Arts & Sciences
- $1,345  School of Engineering
- $1,345  Residential MBA
- $1,345  Institute for Sustainable Environment
- $1,138  Hybrid MBA, Healthcare MBA, On-line MBA
- $  967  Bioethics
- $  931  Education
- Varies  Non-Degree (determined by plan)

**Flat Rate per Term/Program**
- $14,962  Physician’s Assistant Program
- $20,246  Physical Therapy Program
- $14,962  Occupational Therapy Program

Other expenses, such as travel, books, and spending money, vary. An estimated figure is approximately $3,694 for one academic year.
Residential Program Health, Wellness & Recreation Facilities Fee
The $450 per term Residential Health, Wellness & Recreation Facilities Fee is charged to each full-time residential program graduate student. The funds are nonrefundable and are applied toward expenses incurred in the operation of the Student Health Center and the recreational facilities available to students.

Non-Residential Program Resource Fee
The $75 per term Non-Residential Program Resource Fee is nonrefundable and assessed to cover expenses for guest speakers, lecturers, computer lab resources, related software, free transcripts for life, and other like services. CRC students admitted prior to Spring 2016 Quarter, Union College undergraduates, and Leadership in Medicine (LIM) students are grandfathered into pre-merger regulation, and excluded from this fee. For further inquiries about the resource fee, contact Student Administrative Services at sas@clarkson.edu.

Health Insurance
Student health insurance is mandatory at Clarkson University for non-distance program students. Students must either have adequate health insurance coverage through their own policy, be covered by their parents’ policy or enroll in Clarkson’s contracted insurance. The rate for 2017-2018 is $2,514 for coverage from 8/1/17 – 8/1/18. To assure clearance for check-in, students need to complete an e-form in their Student Service Center in PeopleSoft 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. Enrollment indicates that the student agrees to pay all attorneys’ fees and other reasonable collection costs necessary for the collection of any amount not paid when due and will be added to the unpaid balance. It is the University’s policy to withhold transcripts and diplomas until the balance of the account is paid in full.

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

Semester/Trimester Fall/Spring Program Refund Policy
If the student withdraws before the first day of classes 100% refund
1-5 days in term 90% refund
6-10 days in term 75% refund
11-15 days in term 50% refund
16-20 days in term 25% refund
21 term days to end of semester 0% refund
Quarter Program Refund Policy
If the student withdraws before the first day of the term 100% refund
1-5 days in term 90% refund
6-10 days in term 65% refund
11 days to end of term 0% refund
The corresponding refund calculation above will be applied to Tuition, Residential Program Health, Wellness & Recreation Facilities Fee, Non-Residential Program Resource Fee, Room (if applicable) and Meals (if applicable).
*There will be no refund of the student health insurance premium if coverage is in force.

Official Date of Withdrawal
The official date of withdrawal is established upon receipt of written notice of withdrawal from the academic department.

Financial Assistance
Graduate students enrolled in Master’s and PhD level programs may finance their education through a combination of university awards (assistantships, fellowships, and scholarships) and student loans. University awards are granted by each graduate school. US students and permanent residents who are enrolled on at least a half-time basis are eligible to apply for federal student loans. Students must file a FAFSA annually. Refer to the Student Administrative Services website for more information on federal loan programs and application procedures.

University awards currently available include the following:
This aid is awarded by each academic department. Not all types of university awards are available in all programs.

Teaching Assistantships
Teaching Assistantships (TA) provide a stipend plus full tuition. Instructional requirements are up to 20 hours of service per week in laboratory or other designated work for the University during the academic year, or 12 hours of service per week in the above designations during the calendar year.

Research Assistantships
Research assistantships (RA) permit concentration in the student’s research field during the period of study, do not require teaching responsibilities, and provide a standard stipend plus full tuition. Forty hours of service per week, inclusive of classroom work and research duties, are required.

Industrial and Governmental Fellowships
Fellowships permit concentration on the student’s research problem during the entire period of study. Funding may cover full or partial tuition and/or a stipend. The stipend must be at least minimum wage and duties may not exceed 40 hours per week including time to attend classes.

Graduate Assistant
Funding may cover full or partial tuition and/or a stipend. The stipend must be at least minimum wage and duties may not exceed 40 hours per week including time to attend classes.

**Partial Tuition Scholarships/Assistantships**
A number of partial tuition scholarships/assistantships are made available each year. These scholarships may be awarded to deserving students on a merit basis, and may be in addition to other types of financial assistance.

**Financial Aid Types and Work Hours Restriction**

**Full Teaching/Research Assistantship (TA/RA)**
- 20 hours per week work; 20 hours per week study (total 40 hours)
- Permissions: May NOT accept work in any other department

**Partial Tuition Assistantship (PTA)**
- Up to four hours per week (stated in contract); 20 hours per week study (total variable)
- Permissions: May work in other departments-total work hours can NOT exceed 20 hours

**Partial Tuition Scholarship (PTS)**
- No work hours; 20 hours per week study (total 20 hours)
- Permissions: May work in other departments up to 20 hours per week

**Graduate Assistantship (GA)**
- Up to 20 hours per week work (stated in contract); 20 hours per week study (total variable)
- Permissions: May work in other departments-total work hours can NOT exceed 20 hours

**Vacation**
All graduate students, appointed for one year under a Research Assistantship, Teaching Assistantship, or Fellowship are entitled to receive two weeks of vacation plus all holidays when the University is officially closed.

**Satisfactory Academic Progress for Federal Financial Aid**
Federal regulations require that schools monitor the academic progress of every federal financial aid recipient and certify that the student is making satisfactory academic progress towards earning his/her degree. This policy governs federal financial aid only. Institutional awards, scholarships and assistantships may have other requirements. Students may only receive federal aid for courses that are required for degree completion.

Satisfactory academic progress is evaluated at the conclusion of each term and include, per federal regulation both quantitative and qualitative measures. These measures include:

1. **Cumulative Grade Point Average** - a cumulative 3.0 is required. Students with a cumulative GPA less than 2.7 are not eligible for federal aid. (See Financial Aid Warning section below for more information for a student’s whose cumulative GPA is between 2.700 and 2.999)
2. **PACE** – A minimum percentage of attempted credit hours must be earned every semester. PACE is determined by:

Cumulative # of Earned Hours  
Cumulative # of Attempted Hours

Students must maintain a minimum PACE of 50%.

3. The maximum time frame for meeting degree requirements.

Student must complete their degree within 150% of the published length of the program. All graduate credits attempted at Clarkson are applied to the maximum time frame. There is no appeal of the maximum time-frame standard.

**Attempted Credits for PACE and the Maximum Time Frame include:**

- Earned hours – Passed (A-C), Pass (P)

- Repeated Courses – all attempts – refer to the REPEATED COURSE section for detailed information.

- Withdrawal (LW) and (W) - 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” or “LW”.

- Failure (F)

- Incomplete (I)

- All accepted transfer credits (including consortium agreements & Study-Abroad courses) & test credit (T)

- All graduate courses attempted at Clarkson, even if they are not used to meet degree requirements.

**Earned credit hours for PACE include:**

- Grades of A, B, C or P (with credit)

- All accepted transfer credits (T)

**Financial Aid Warning**

A student whose cumulative GPA is between 2.700 and 2.999 and/or whose PACE is less than 50% is not making Satisfactory Academic Progress for Federal Financial Aid. The student is notified by the Financial Aid Office via email to the student’s Clarkson email address 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 federal financial 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 Federal Financial Aid and is eligible for federal 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 via email to the student’s Clarkson email address that he/she is not making Satisfactory Academic Progress for Federal Financial Aid and is ineligible for federal aid for subsequent terms. A student may not have two consecutive Financial Aid Warning terms.

**Financial Aid Appeal Process**

A student who does not meet the federal financial aid satisfactory academic progress standards at the conclusion of the warning term or a student whose GPA is less than 2.7 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 or other situations specific to the individual student.

There are four required elements of an appeal:

1. A completed and signed appeal form.
2. 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).
3. Supporting documentation - A student requesting an appeal must submit supporting documentation such as a physician’s written statement to substantiate illness or accident, a copy of a death certificate or newspaper obituary, a written statement 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.
4. 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 to four terms and includes specific requirements the student must achieve. Although the student is not making satisfactory academic progress, federal aid is reinstated on a term by term basis.

A student interested in filing an appeal must begin the process by contacting the Graduate Student Service Representative at the CRC Campus or Potsdam Campus at least two weeks prior to the beginning of the term he/she wishes to receive federal financial aid.

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 Financial Aid Office Appeals Committee in conjunction with faculty members and advisors from the student’s program of study as well as other Clarkson University personnel as necessary.
The Office of Financial Aid will notify the student by e-mail of the final decision. If the appeal is approved the Associate Director of Financial Aid at the CRC Campus or the Graduate Student Administrative Representative at the Clarkson Campus will begin the Academic Plan process. Once the Academic Plan has been designed and required signatures have been obtained the student will be placed on Financial Aid Probation and federal aid eligibility will be reinstated for the term.

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 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 federal 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 aid at Clarkson until both standards are met. Students who are ineligible for aid may regain eligibility by taking courses at Clarkson without receiving federal aid that raises their GPA to the minimum standards and/or increases earned hours to the minimum PACE requirements.

**Financial Aid with Repeated Courses**

Courses in which a grade of F, W or LW 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.

Additionally, federal regulations allow a student to repeat a course once if the student previously earned credit for the course (A, B, or C). 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. 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 Federal Financial Aid**

For purposes of determining SAP for federal and institutional financial aid, all grade changes including incompletes must be submitted to SAS prior to the 10th day of the subsequent term. This deadline may differ from academic departmental guidelines.

**Readmitted Students and Financial Aid**

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 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 email to the student’s Clarkson email address of his/her status and the appeal process.

**Enrollment Status**
A graduate student will be classified as full-time in any term in which he or she is enrolled in at least nine credit hours per semester or six credit hours per quarter. When such degree requirements have been met, the student will be required to register for at least one credit hour of project/thesis, be in residence, and be actively engaged full-time in completing the project/thesis in order to be classified as a full-time student.

A graduate student will be classified as half-time in any term in which he or she is reenrolled in at least 4.5 credits hours per semester or 3 credit hours per quarter.

**Student Leave**
Graduate students planning to exit the University, whether permanently or for a leave of absence, must initiate the process in the appropriate academic school or institute.

A leave of absence for a graduate student is permitted at the discretion of the graduate coordinator, department chair, or dean of the school. The University may require a written statement from the student, and other documentation as may be appropriate, to support a leave of absence or withdrawal request.

If a student’s intent is to permanently leave the University or the student is not in good academic standing, the student will be withdrawn from the University. The effect of a withdrawal on a student’s transcript and finances is based on the date of the withdrawal. For information on grading policies relating to withdrawal, contact the SAS office or refer to the Clarkson Regulations. Refund policies for withdrawals may be located in this catalog and can also be found in the Clarkson Regulations.

**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. Students may cross-register for courses within the consortium, and some sharing of faculty takes place. To be eligible to cross-register, graduate students must be considered full-time based on their
program of study. Eligible students can take up to two courses (not available at their home institution) per academic year totaling no more than 8 credits on a space-available basis at one or another of the campuses. Employees taking courses in Clarkson’s MBA program may take two half-semester, 2-credit module courses, to count as one course toward the cross-registration limit. If only one 2-credit module is taken, that counts as one course. An academic year for cross-registration includes the fall and spring semesters. Students enrolled in quarter-based programs are not eligible to cross register.

There is a special form and instructions for cross-registration available online at http://associatedcolleges.org/services/crossregistration.html, or from the Associated Colleges office (267-3331 or acslv@potsdam.edu). The completed form is returned to Student Administrative Services.

Students will be enrolled as non-matriculated students at the host institution and the 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. Graduate students must receive a grade equivalent to a B (3.000) or higher at Clarkson. Grades in such courses are not used in computing a student’s GPA. If cross-registration credits result in a course load requiring additional tuition charges, the student is responsible for those additional charges. Students are responsible for any special fees, such as lab fees, fees for registration, or transcript fees.
GRADUATE STUDENT AFFAIRS
Student Affairs is a catalyst for bridging diverse academic, cultural, professional and social experiences. Graduate students are provided with a variety of support services dedicated to meeting the needs of those pursuing advanced education. Student Affairs leadership also works closely with the Graduate Student Association (GSA) to support and to provide a social experience that complements campus-based programs. Student Affairs staff and services are available for all graduate students, including online programs.

Clarkson Regulations
Each graduate student is responsible for knowing the contents of Clarkson Regulations. This document, in its entirety, for Institutional policy and regulations including student conduct and conditions for unsatisfactory conduct, can be found at on the Clarkson website (non-modifiable document updated the start of each fall term).

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 gives the Clarkson graduate 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 information on their specific orientation and associated academic programs.

Graduate Student Association (GSA)
The GSA is an organization that directly represents the interests of the graduate student body and provides a variety of social programs during the entire year for students on all campuses. Sample events from the past year include recognition dinners, social hours, athletic events, and much more. This group works closely with the Student Affairs Division to ensure the needs and interests of graduate students are met.

Graduate Housing and Dining
A wide range of housing accommodations are available near Clarkson campuses. For detailed information or for copies of the listings of off-campus private rentals of rooms, apartments, or houses, contact the graduate coordinators for each program. Residence halls at the Potsdam campus are primarily for single undergraduate students. Potsdam campus graduate students may contract for meals in any of the University dining halls on a term basis even though they do not reside in a residence hall. They may also elect to eat on a cash basis in the Student Center or in the Cheel Campus Center.
Extracurricular Activities, Cultural, and Recreational Opportunities
There are many opportunities to enhance the educational experience through participation in a range of extracurricular activities.
The Clarkson community has easy access to many cultural and recreational facilities throughout New York state, New England, and Canada, as well as on each campus.

Religious and Spiritual Life
Although it is not a church-affiliated university, Clarkson is interested in the moral and spiritual development of its students. Some students pursue their spiritual development in personalized ways, while others attend services of organized religious groups.

Student Center & Graduate Student Lounge / Atriums
The Student Center is the focal point of activities on the Potsdam Hill campus. Similarly, the Capital Region Campus offers the student atrium at the entrance of the Main Building. The Student Center and the atrium are places where students can come to spend time between classes, study, and hold meetings and evening events. There are a variety of lounges and spaces with comfortable chairs and tables for studying and relaxing. In addition, meeting rooms are available for group meetings and other activities. Also available to students in the Student Center is the Forum, an innovative auditorium in the form of a stairwell equipped with a massive video wall. The space is often used for large events such as lectures, showcases, comedians, pre-released movie showings, and dances.

In addition to being a great place to connect with your classmates, the Student Center is the home of many departments and services on campus. On the ground level of the Student Center you will be able to visit the Graduate Student Lounge, Student Center Info Desk, Student Organizations office, JAVA City, Bar 9, and even get money through our North Country Savings Bank ATM. On this level you will find the traditional game room with Pool, Darts, Foosball, Bubble Hockey and Ping Pong games all free for student usage.

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

Student Diversity and Inclusion
SS, D & I collectively houses units that are leading campus-wide efforts to strengthen and develop key initiatives to support diversity objectives related to student access, academic success, campus involvement, and leadership development that will ultimately lead to career success and lifelong engagement with Clarkson.
The mission of the Student Success, Diversity and Inclusion organization is to serve and embrace all students. We are committed to providing access and opportunity programming for student success. Using a collaborative approach, we provide academic monitoring and advisement, student engagement, professional development opportunities and support retention initiatives to graduate culturally competent students.
Health & Counseling Center
Counseling Services
Personal counseling is provided by full-time professional counselors who are prepared to deal with a variety of concerns including stress, alcohol abuse, eating disorders, depression and sexual issues. However, students not only seek help for specific problems, but make use of counseling to explore feelings, values and life directions. The counseling staff offer a variety of modalities and assessments that can help increase self-awareness and clarify goals. In addition to counseling, the staff is prepared to make appropriate medical referrals.

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

Students attending classes at our CRC or Beacon campuses should consult their graduate program coordinators for questions pertaining to local health services.

Office of AccessABILITY Services
This is the initial point of contact for students with documented disabilities seeking accommodations or services. The office is responsible for maintaining disability-related documentation, certifying eligibility for receipt of services, determining reasonable accommodations, and ensuring the provision of those services. Students are asked to contact the Office of AccessABILITY Services prior to the beginning of each term at Clarkson. The student will meet with the Director of the Office of AccessABILITY Services to review documentation and determine appropriate accommodations. The Office of AccessABILITY Services will assist the student with faculty and staff notifications requesting appropriate accommodations. Appropriate accommodations will be provided to students who have followed the procedures as developed by the Office of AccessABILITY Services. Services may include short-term arrangements for students who have become temporarily disabled. Office staff is available for consultation via conferencing software for students enrolled at CRC, Beacon, or in an online program.

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

**Career Center and Job Search Services**

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

The Center facilitates a wide number of career-oriented workshops for first-year students through graduate-level students, including career exploration groups, resume preparation, interviewing techniques, and job-search techniques. The mock interview program is noted for its success in preparing students for their job interviews.

Among the many benefits of a Clarkson education is the alumni network. Alumni serve as a critical link to the Center. The Center also reaches out to the community by planning programs with any campus organization or academic program. The Career Center provides access to internship, co-op, and permanent job opportunities through the following means: an on-campus recruiting program with business, industry and government; Career Fairs; a Web-based resume database system that enables the Center to provide students’ resumes to employers; a job-listing and networking service on the Internet called CareerShift; and a network of thousands of Clarkson alumni who can be tapped at any time in the students’ years at the University.

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

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

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

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

Typically, students participate in the Co-op Program for an academic semester and a summer. Students may choose to co-op from January through August or from May through December. However, the co-op work block timeframe is very flexible and the University makes every effort to match a student’s academic plans with a company’s work schedule. To help prepare students for the co-op experience, the Career Center provides skill-based seminars and workshops. The focus of these programs is on writing resumes, cover letters, practicing job interviews, and teaching students how to conduct a successful job search. A key decision for the student is how to make up coursework missed while in the workplace. Students can choose to attend summer school, use advanced placement 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.

**Study Abroad Program**

Study Abroad provides an excellent opportunity for students to enhance their academic background and prepare for the global marketplace through exposure to another educational system and culture. The primary program open to all students offered by the International Center is the Student Exchange Program. For graduate students, the program is designed to provide opportunities for a semester or a year abroad doing research at a partner university. Graduate students also have the opportunity to take courses for credit at some of our partner universities. Students go through a competitive application process to be considered for the program. Clarkson University has articulated exchange agreements with over 50 universities in 28 countries.

**Exchange Program Academic Policies**

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

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

**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.

If you plan to study abroad, many of our partner universities will allow you to apply for internships that would follow your study semester. There are also other opportunities that can be identified through –contacting the International Center Office.

**International Student & Scholar Services**

This part of the International Center informs and educates the international population as well as the University community on immigration regulations that govern international students, scholars and the University. The ISSS also coordinates services and benefits available to the international
population and facilitates international cultural events within the Clarkson community.

**Campus Safety and 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](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 identifying and recruiting quality high school students, and assisting the Career Center in providing career opportunities for our graduates. Alumni are also involved in supporting fund-raising efforts, mentoring undergraduates, serving as speakers on campus, serving on advisory councils, and providing opportunities to learn the value of being engaged alum. There is an extensive regional Clarkson alumni chapter program for alumni once they leave the University. Regional volunteers in numerous cities throughout the United States host alumni activities. Clarkson alumni stay in contact with friends and the University through various social networks including CU Online, the community for staying connected!
Athletics

Steven Yianoukos '72, Director of Athletics
syianouk@clarkson.edu

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. Additional information on Clarkson Athletics may be found on the Clarkson website.

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 and Arena.

Office of Information Technology

Joshua Fiske, Chief Information Officer
jfiske@clarkson.edu

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**
Because 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.

**University Libraries**
*Michelle L. Young, Director of Libraries/Associate Professor*
myoung@clarkson.edu

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

The Harriet Call Burnap Memorial Library is the main library located on the Potsdam hill campus in the Educational Resources Center (ERC). Its collection is comprised of materials in various formats including journals, books, audio visual materials, government documents and reports, Clarkson University dissertations, and archival materials. The Health Science Library is the University Libraries’ branch library and is located in the Center for Health Sciences (Clarkson Hall) on the downtown Potsdam campus. This unique collection serves the University’s allied health programs as well as the local health industry.
SCHOOL OF ARTS & SCIENCES
Charles E. Thorpe, Dean  
cthorpe@clarkson.edu  
Jerry W. Gravander, Associate Dean  
jgravand@clarkson.edu

The School of Arts & Sciences has graduate programs in the disciplines of Biology, Chemistry, Computer Science, Mathematics, Physics; and professional graduate programs in Occupational Therapy, Physical Therapy and Physician Assistant Studies. Faculty and students also participate in the interdisciplinary Data Analytics, Engineering Science, Environmental Science and Engineering, Environmental Policy and Governance, and Materials Science and Engineering graduate programs, as well as the graduate Master of Arts in Teaching. More information can be found in the Institute for a Sustainable Environment, Institute for STEM Education and the Interdisciplinary Program sections of the catalog.

Basic Science Program
Thomas Lufkin, Bayard and Virginia Clarkson Endowed Chair of Biology  
tlufkin@clarkson.edu

Clarkson offers a Master’s degree in Basic Science for qualified students who desire graduate study within the sciences, with a focus that does not fit within one of the degree programs already established. The Basic Science MS program also provides a platform for specialization in Biology. While the most common option for this degree is to concentrate in biosciences, other concentrations are offered from time to time.

MS degree in Basic Science (thesis and non-thesis options)
Prerequisites for Admission
Applicants must possess a baccalaureate (4-year) degree in biology or a relevant science major (e.g., biochemistry, biophysics, environmental science) and must have completed the following minimum college course preparation: three semesters of biology including genetics, four semesters of chemistry including organic chemistry, two semesters of physics, and two semesters of mathematics including calculus.

Program Length
All work done for the master’s degree in basic science is to be completed within five calendar years, although it is normative to complete this degree in 2 years.

Faculty
Professors Tom Langen, Thomas Lufkin, Michael Twiss, Craig Woodworth; Associate Professors Kenneth Wallace, Damien Samways; Assistant Professors Susan Bailey, Andrew David, Cintia Hongay, Ginger Hunter, Stefanie Kring, Shantanu Sur; Research Assistant Professor Petra Kraus
Bioscience and Biotechnology Programs
Thomas Lufkin, Bayard and Virginia Clarkson Endowed Chair of Biology
tlufkin@clarkson.edu

The Department of Biology offers a graduate programs leading to the MS and PhD degrees in Bioscience and Biotechnology. Please see the Interdisciplinary Program section of this catalog for information on the Masters in Interdisciplinary Bioscience and Biotechnology Program. The goal of these programs is to train students with the skills needed to work on complex problems in the biosciences. To support this aim, the graduate program faculty includes biologists, chemists, physicists, mathematicians, and engineers who serve as dissertation advisors. The program also requires participation of social scientists and ethicists who teach graduate courses in bioethics. In addition to the general program requirements described below, students are expected to acquire a significant specialized body of knowledge in at least one of the following four areas of specialization to provide intellectual depth to their education: (1) Molecular Bioscience & Biotechnology, (2) Biomedical Sciences & Neuroscience, (3) Computational Biology & Bioinformatics, or (4) Ecology, Evolution & the Environment.

The faculty in the program are engaged in research covering a wide range of subjects in Bioscience and Biotechnology. Expertise of core program faculty include developmental genetics, tissue regeneration, tissues and biomaterials, microbial evolution, cell molecular biology, neurophysiology, pharmacology, bioinformatics, biomathematics, zoology and evolutionary parasitology, animal behavior, conservation biology, ecology, and limnology.

Requirements for Admission
Applicants must possess a baccalaureate (4-year) degree in biology or a relevant science major (e.g., biochemistry, biophysics, environmental science) and must have completed the following minimum college course preparation: three semesters of biology including genetics, four semesters of chemistry including organic chemistry, two semesters of physics, and two semesters of mathematics including calculus. Submitted application materials must include an official undergraduate transcript, statement of purpose, three letters of recommendation, and score results of the Graduate Records Examination (GRE) aptitude test. The GRE requirement may be waived for students with a Clarkson B.S. degree, at the discretion of the IBB Program Director. All international students for whom English is not a first language must submit a TOEFL score unless their undergraduate or master of science degree was in the English language. The admissions committee will select candidates on the basis of aptitude, programmatic needs, and overall excellence of academic qualifications.

Degree Requirements for the PhD in BioScience & Biotechnology
Clarkson University requirements include completion of a minimum of 90 total credit hours including a minimum of 24 credits of course work, a minimum of six credit hours in research seminars, and an original doctorate thesis research project submitted as a written dissertation defended orally and approved by a committee of five PhD faculty members. Specific Course Requirements for the Interdisciplinary Bioscience & Biotechnology (IB&B) Program include: two core courses in cell and molecular biology (BY680 & BY682), one biotechnology or molecular biology lab course (BY612 or
CM570), two specialization elective courses from one of four categories (Molecular Bioscience & Biotechnology, Biomedical Science & Neuroscience, Computational Biology & Bioinformatics; Ecology, Evolution & the Environment), one free elective course from any category, one course from the Computational Biology category and one course on Bioethics, Policy, or Law. Please see Detailed Degree Requirements for more information.

**Program Requirements**

*Required Two Core Graduate Lecture Courses (6 cr):*

- BY680 Advanced Cell Biology (3 cr)
- BY682 Molecular Genetics (3 cr)

*Required Graduate Laboratory Course (Choose one):*

- BY612 Molecular Biology Laboratory (4 cr)
- BY670 Biochemistry & Biotechnology Laboratory (3 cr)

*Specialization Elective Credits (6 cr):*

- Any 2 courses from one of the four specialization categories listed below

*Free Elective Credits (3 cr):*

- Any course from one of the specialization categories

*Computational Biology Requirement (3 cr):*

- Any course from the Computational Biology & Bioinformatics specialization category

*Biology, Society, & Bioethics Requirement (3 cr):*

- Any course from the Biology, Society, & Bioethics category

*Seminar Requirement (6 cr):*

- BY622 Graduate Seminar (6 cr taken over 6 semesters)

**Specialization Area Courses:**

**Molecular Bioscience & Biotechnology**

- BY510 Developmental Biology (3 cr)
- BY515 Recent Advances in Immunology Research (1 cr)
- BY560 Comparative Physiology (3 cr)
- BY562 Comparative Physiology Lab (2 cr)
- BY586 Molecular Biotechnology (3 cr)
- BY612 Molecular Biology Laboratory (4 cr)
- BY650 Biochemistry I (3 cr)
- BY651 Biochemistry II (3 cr)
- BY652 Pharmacology (3 cr)
- BY680 Advanced Cell Biology (3 cr)
- BY682 Molecular Genetics (3 cr)
- CM520 Separations and Electrochemistry (3 cr)
- CM530 Colloid and Interfaces (3 cr)
- CM544 Medicinal Chemistry (3 cr)
- CM553 Medicinal and Pharmaceutical Biomaterials (3 cr)
- CM562 Physical Chemistry for Life Sciences I (3 cr)
- CM563 Protein Chemistry & Proteomics (3 cr)
- CM566 Bioelectronics & Bionanotechnology (3 cr)
- CM570 Biochemistry & Biotechnology Laboratory (3 cr)
ES552 Biomaterials & Biomedical Engineering Applications (3 cr)
PH526 Introduction to Biophysics (3 cr)

**Biomedical Sciences & Neuroscience**
BY519 Immunobiology (3 cr)
BY518 Principles of Toxicology and Epidemiology (3 cr)
BY520 Microbiology (3 cr)
BY540 Introduction to Biomedical Rehabilitation Engineering & Science (3 cr)
BY548 Medical Microbiology (3 cr)
BY571 Anatomy & Physiology I (3 cr)
BY572 Anatomy & Physiology II (3 cr)
BY573 Anatomy & Physiology Lab I (2 cr)
BY574 Anatomy & Physiology Lab II (2 cr)
BY576 Current Topics in Biology & Medicine (3 cr)
BY588 Stem Cells and Regenerative Medicine (3 cr)
BY604 Molecular Pharmacology (3 cr)
BY655 Cell and Molecular Biology of Cancer (3 cr)
BY660 Neurobiology (3 cr)
ME380 Special Topics: Biomechanics (3 cr)

**Computational Biology & Bioinformatics**
BY514 Bioinformatics (4 cr)
BY610 Ecological Statistics and Experimental Design (3 cr)
ESS05 Design of Experiments and Analysis of Data (3 cr)
MA571 Numerical Solution of Differential Equations (3 cr)
MA580 Introduction to Monte Carlo Simulation (3 cr)
STAT582 Mathematical Statistics I (3 cr)

**Ecology, Evolution, and the Environment**
BY525 Biological Systems & Environmental Change (3 cr)
BY528 Conservation Biology (3 cr)
BY531 Limnology (3 cr)
BY532 Limnology Lab (2 cr)
BY620 Evolution (3 cr)
CE575 Coastal Engineering (3 cr)
CE577 Atmospheric Chemistry (3 cr)
CE579 Water and Wastewater Treatment Design (3 cr)
CE580 Environmental Chemistry (3 cr)
CE682 Environmental Biological Processes (3 cr)
CH509 Receptor Modeling in Environmental Chemistry (S, 3 cr)
EHS 505 Methods and Analysis (3 cr)
ESS33 Human Exposure Analysis (3 cr)
ESS34 Air Pollution Control (3 cr)

**Biology, Society, and Bioethics**
BY567 Current Topics in Biology and Medicine (3 cr)
HIST520 Medicine and Society in America (3 cr)
HIST553 Medicine and Medical Ethics During the Third Reich (3 cr)
PHIL541 Medical Ethics (3 cr)
POL580 The Law and Bioethics (3 cr)

Program Length
The PhD may be completed in a minimum of three years and a maximum of seven years of post-undergraduate study. **Core Faculty in Bioscience and Biotechnology**

Biology
*Professors Tom Langen, Thomas Lufkin, Michael Twiss; Associate Professors Kenneth Wallace, Damien Samways; Assistant Professors Susan Bailey, Andrew David, Cintia Hongay, Ginger Hunter, Stefanie Kring, Shantanu Sur; Research Assistant Professor Petra Kraus*

Affiliated faculty include faculty in the Departments of: Chemistry & Biomolecular Science, Chemical & Biomedical Engineering, Civil & Environmental Engineering, Electrical & Computer Engineering, Institute for a Sustainable Environment, Mathematics, Computer Science, Mechanical and Aeronautical Engineering, Physics, Physical Therapy and Psychology

Chemistry Program
*Devon A. Shipp, Chair of Chemistry and Biomolecular Science*
*graduate@clarkson.edu*

For specific questions regarding the Chemistry, MS, PhD programs, chemgrad@clarkson.edu

The Chemistry & Biomolecular Science department offers a graduate program leading to MS and PhD degrees in Chemistry and has provided a first class education to students of chemistry, material science and biomolecular science for more than 50 years. Our groundbreaking researchers are recognized as pioneers in colloid and fine particle research and discovery, many of whom enjoy outstanding international reputation for their research accomplishments. The diverse, yet complementary research interests provide incoming students with a broad variety of research topics from which to choose in bio-nanotechnology, smart surfaces and interfaces, functional and stimuli responsive materials, nano-therapeutics, diagnostics and biosensors. Advance study through coursework and independent research under the guidance of a faculty adviser will prepare students for leading positions in industry or academia. Graduate researchers will work on projects that address many of today's most pressing problems related to the environment, advanced manufacturing, sustainable energy and healthcare. Departmental research is supported by federal grants, primarily from the National Science Foundation (NSF), New York State and private industry.
Prerequisites

PhD Prerequisites
Applicants must possess a baccalaureate (BS) or a master (MS) degree in chemistry or a related major (e.g., material science, biochemistry, biophysics, environmental science) and must have completed the following minimum college course preparation: introductory chemistry courses including general chemistry as well as specialized classes in organic chemistry, analytical chemistry, physical chemistry, inorganic chemistry and biochemistry. In addition, basic training in mathematics and physics is required.

Courses
Courses will be chosen from graduate level offerings (500 and above) and must meet all established requirements. There is no set list of required courses and choices will be made in consultation with student’s advisor and influenced by student’s area of interest. Candidates in chemistry must:

- Complete a minimum of 6 credit hours of seminar [CM900]
- Present 3 seminars as part of their PhD degree requirements.

Program Length
All work required for the master’s degree in chemistry is to be completed within five calendar years, although it is normal to complete this degree in 2 years. After required comprehensive examinations are passed, all work done specifically for the doctorate degree is to be completed within a period of seven calendar years, although it is normative to complete this degree in 3-4 years.

Chemistry Faculty
Professors Silvana Andreescu, Dan Goia, Evgeny Katz, Devon Shipp, Richard Partch; Associate Professors Phillip Christiansen, Costel Darie, Artem Melman, Galina Melman, James Peploski, Jiayin Yuan; Assistant Professors He Dong, Paul Goulet, Mario Wriedt; ; Emeritus Professor Petr Zuman

Computer Science Program
Christopher A. Lynch, Program Chair
clynch@clarkson.edu

The Department of Computer Science offers graduate programs leading to degrees of Master of Science (offered interdisciplinary with the Department of Electrical and Computer Engineering) and Doctor of Philosophy in Computer Science. These programs are designed to increase the student’s
fundamental knowledge and to give the student guidance and experience in research. A graduate student pursues these objectives by taking advanced courses, participating in seminars, and carrying out and reporting on a research project. The department provides the advantage of close personal association between graduate students and faculty, giving special attention to individual needs and interests. Please see requirements for MS in Computer Science in the Interdisciplinary Programs Section of the Catalog.

Requirements for PhD in Computer Science

1. A minimum of 90 credit hours earned for graduate courses numbered 500 and higher including at least 36 credit hours of classroom and instructional laboratory coursework (this is above the university minimum of 24); a minimum of 6 credit hours of research seminar. A maximum of 30 credit hours of graduate transfer credit from an MS degree with grades of B or higher may be accepted toward the PhD degree.
2. At least three full academic years of study beyond the baccalaureate degree with at least two years in residence in Clarkson.
3. A cumulative GPA of 3.0 in courses used to meet graduation requirements.
4. Graduate students must complete the PhD candidacy procedure within two years of full time study after admission to the PhD program.
5. Doctoral candidates must complete an original research project submitted as a written thesis to be orally presented and approved before a committee of at least five faculty members. At least four members must be Clarkson faculty of assistant professor rank or higher and possessing a doctoral degree. At least one committee member must be from a department other than the candidate’s major department. An external examiner with appropriate credentials from outside the university may serve as one of the five committee members. The thesis must also be approved by the Dean of the Graduate School and a copy deposited in the university library.

Additional Program Requirements and Procedures

Students must complete a minimum of 36 credits of computer science related coursework including:

- Four required courses across three areas – CS 541 (Theory), CS 547 (Theory), CS 544 (Systems) and CS 545 (Languages).
  A grade of B+ or better is required in each of these courses. A written exam option is offered for students who have taken equivalent courses at other institutions and for students who did not receive a B+ in the Clarkson course. Students who have taken equivalent courses at other institutions and pass the exam with a grade of B+ or better can replace the corresponding course by another CS course. A minimum of four 3-credit research-oriented 600-level CS courses. Research-oriented courses include substantial research literature review and a research project/presentation component.
  The Computer Science PhD Committee will maintain a list of acceptable by permission of the Computer Science PhD Committee only when they satisfy the same standards as regular 600-level CS courses and include substantial research literature review and a research project/presentation component. A grade of B+ or higher is required in two 600-level CS courses in order to advance to candidacy and one of these must be a research-oriented 600-level course.
Beyond the four required courses listed in Foundations, students must take one course from each of the following four groups. Courses used to satisfy this breadth requirement may also be used to satisfy the requirements in Research. The specific lists of courses may change and students may petition the Computer Science PhD Committee to accept additional courses, including courses outside the department, in these groups.

**Group A (Theory and Algorithms):** 542, 546, 549, 556, 642, 647, 649, 656, 661
**Group B (Computer Systems and Networks):** 553, 555, 557, 563, 566, 644, 654, 657
**Group C (Languages and Software Development):** 543, 550, 558, 560
**Group D (Artificial Intelligence and Applications):** 551, 552, 559, 561, 562, 652, 653, 659, 668

Additional Courses as necessary to reach 36 course credits. Students are expected to take at least one graduate course in computer science or a related field each semester that they are enrolled in the Computer Science PhD Program. This requirement may be waived if in consultation with the student’s advisor, the Computer Science PhD Committee decides it is in the student’s best interest to focus on completion of their thesis work.

Students are required to attend and participate in the CS 707 or 708 Seminar in Computer Science (1 credit) series during at least six semesters in residence in the PhD program. Participation is recommended during each semester in residence in the PhD program.

The doctoral candidacy procedure for the Computer Science program is portfolio-based. Before advancing to candidacy, students must have completed the 4 required courses (CS 541, CS 547, CS 544 and CS 545) and two of the 600-level CS courses at least one of which must be a research-oriented course. A grade of B+ or higher is required in each course. Students prepare a portfolio consisting of a written statement of research interest and representative work from courses and seminar (e.g. exams, research papers, presentation materials). The student appears before the Computer Science PhD Committee for an oral defense of their portfolio. This oral defense and portfolio examination constitutes the comprehensive exam for candidacy in Computer Science.

To advance to candidacy, the student must have also chosen a faculty advisor who believes he or she is prepared to begin original research in a mutually acceptable field of specialization. Students must advance to candidacy within two years of full-time study after admission to the PhD program or be granted an extension by the Computer Science PhD Committee. The doctoral candidacy procedure for the Computer Science program is portfolio-based.

The student must write a thesis proposal outlining his or her research plan and discussing related work and defend this proposal in an oral exam before his or her thesis committee. In addition to the university requirements, at least three members of the committee must be from the Computer Science Department. Students must form their committee and pass the thesis proposal defense exam by the end of their third year of full-time study after admission to the PhD program or be granted an extension by the Computer Science PhD Committee.

The final step in completion of the doctoral program is the submission of a written thesis in conjunction with an oral thesis defense. The candidate will normally present a 50-minute oral presentation of the thesis work at an advertised campus event followed by at least 10 minutes of public questions. After the end of the public session, the candidate and their 5-member thesis
committee will gather in closed session for final questions and presentation of corrections to thesis. The candidate will be then asked to leave the room for a final vote of approval. Following approval, the candidate must complete the requested corrections to the written thesis and obtain final signatures. The candidate must provide all five thesis committee members with a copy of the thesis at least four full weeks before the public defense. The thesis committee for the final defense is the same as for the proposal defense. Any changes must be approved by the Computer Science PhD Committee in advance of the final defense.

Program Length
All work done for the master’s degree in computer science is to be completed within five calendar years, although it is normative to complete this degree in 2 years. All work for the PhD degree must be completed within seven years after admission to candidacy.

Faculty in Computer Science
Professor Daqing Hou, Christopher Lynch; Associate Professors Alexis Maciel, Jeanna Matthews, Christino Tamon; Assistant Professors Natasha Banerjee, Sanjib Banerjee, Faraz Hussain, Yaoqing Liu

Mathematics Program
Joe Skufca, Chair
iskefca@clarkson.edu
Kathleen Kavanagh, Graduate Committee Chair
kkavanag@clarkson.edu

The Department of Mathematics offers graduate programs leading to the Master of Science and Doctor of Philosophy degrees in Mathematics. These programs are designed to increase the student’s fundamental knowledge and to give the student guidance and experience in research. A graduate student pursues these objectives by taking advanced courses, participating in seminars, and carrying out and reporting on a research project. The department provides the advantage of close personal association between graduate students and faculty, giving special attention to individual needs and interests.

Faculty members are engaged in research over a wide range of subjects in the mathematical sciences. Current research interests include: dynamical systems, chaos, nonlinear dynamics, complex networks, critical phenomena and statistical mechanics, imaging science, functional analysis, numerical analysis, computational applied mathematics, reaction-diffusion equations, population dynamics, inverse problems, optimization, hybrid and derivative-free optimization, sensitivity analysis, finite-element and multigrid methods, fluid dynamics, atmospheric models, regional climate dynamics, computational geosciences, applied probability and statistics, multivariate and inferential statistics, application of nonparametric statistics, and biostatistics and biomathematics.

Prerequisite Courses
Applicants must possess a baccalaureate degree in mathematics or a relevant major. Submitted application materials must include an official undergraduate transcript, statement of purpose, three letters of recommendation, and score results of the Graduate Records Examination (GRE) aptitude
test. The GRE requirement may be waived for students with a Clarkson BS degree at the discretion of the Program Coordinator. All international students for whom English is not a first language must submit a TOEFL score unless their undergraduate or master of science degree was in the English language. The admissions committee will select candidates on the basis of aptitude, programmatic needs, and overall excellence of academic qualifications.

Program Requirements

MS Degree
Students entering with a BS degree are required to take a minimum of 18 credit hours of coursework (six three-credit graduate courses) and six to 10 credit hours of thesis. A minimum total of 30 credits is required for the MS degree. The program for research assistants and teaching assistants during each semester of the academic year is a minimum of nine credit hours, at least one credit hour of which is thesis. The thesis advisor will set up the program within this framework and the department will approve it or recommend changes.

The MS thesis is normally written during the summer and orally presented and defended in late summer or fall before a committee of three or four department faculty. In lieu of a thesis, a student may do a special project. The student receives the MS degree at the next commencement after the thesis is accepted.

PhD Degree
A minimum of 90 credit hours are required for the PhD. This corresponds to a minimum of three academic years of full-time study, of which two must be in residence at Clarkson. The MS degree may be accepted in lieu of a maximum of 30 credit hours. Of these 90 credit hours, a minimum of 39 credit hours must be in coursework. The coursework presented for the PhD must include at least 15 credit hours in the major field, at least nine credit hours in a minor field, and at least six credit hours from out-of-department courses. Beyond the 39 required hours of coursework, six credit hours in seminar work are required, and the remaining 45 hours is thesis or coursework. A comprehensive examination based on general preparation in the major field is required. There is no foreign language requirement for the PhD. Candidates for the PhD are required to prepare an original dissertation in an advanced research area and defend it in an oral examination.

Degree Requirements

Masters of Science Degree in Mathematics
1. Students must complete 30 credit hours subject to the following restrictions:
   - At least 20 credit hours of course and seminar work must be earned in residence at Clarkson
   - At least 16 hours must be earned in the Department of Mathematics as courses and seminars numbered above MA 505, with at most one of these credits coming from seminar. Among the courses, one course must be MA 521 Classical Complex Analysis, MA 522 Classical Real Analysis or MA 578 Numerical Analysis, and two other courses must be at the 500 or 600 level. The remainder of your coursework must be approved by your advisor in collaboration with the Graduate Committee Chair.
   - Have an overall grade point average of at least 3.00 in his/her course work
2. Fulfill one of the following:
   - Write a thesis under the guidance of a faculty member. The thesis is to be an original or
expository study of some area or problem and shall represent 6 to 10 credit hours. The topic of the thesis must be approved by the graduate committee and thesis advisor in advance. As required by University regulations, the thesis must be examined by a committee of at least three Clarkson faculty appointed by the chair of the department.

- Pass two qualifying exams described under the requirements for the PhD degree. The choices must be approved by the student’s advisor and the graduate committee.
- Pass one exam from either of the categories (I or II) listed in the PhD requirements, plus complete a special project. A description of the proposed project must be approved in advance by the student’s advisor and the graduate committee. When the project is completed it must be approved by the graduate committee. Completion will carry 3 to 9 hours at the discretion of the student's advisor.

PhD Degree in Mathematics

Students must:

- Take at least 39 credit hours of approved course work (30 of which may be those taken for the MS degree) As required by University regulations, the course work must contain a minimum of fifteen hours in his/her major area, a minimum of nine hours in a minor area, and a minimum of six hours of work outside the department. Cross registered graduate level courses from other institutions are acceptable. The major area and minor area will be identified by the candidate's advisor and must be approved by the graduate committee.
- Have an overall grade point average of at least 3.00 in his/her course work.
- By the end of the second semester (not including summer) every Ph.D. student must pass a General Comprehensive Exam. The purpose of this exam is to determine whether a student possesses the fundamental knowledge and skills to pursue Ph.D. level research and course content. The topics cover Calculus, Differential Equations, Linear Algebra, Real Analysis, Probability, and Statistics. The exam is offered in August, January, and May. By the fourth semester (summer not included) every Ph.D. student must pass two additional written Comprehensive Examinations. One exam will be from Category I and one from Category II below. The choices must be approved by the student's advisor and the graduate committee. In the event that a student has not satisfied these conditions within the time limit allowed, they must petition the graduate committee in order to continue their studies.

**Category I:** Real Analysis, Complex Analysis, Sets and Topology, Numerical Analysis

**Category II:** Matrix Theory and Computations, Partial Differential Equations and Boundary Value Problems, Ordinary Differential Equations, Probability and Measure Theory, or Statistics.

- Acquire at least six hours of seminar credit. A seminar is a course in which the student is expected to make presentations to the class. This is in addition to the minimum of 39 credit hours of approved coursework above. One hour of seminar credit may be earned by either attending a regular scheduled seminar and making one presentation, or attending all colloquia for one semester and giving one presentation at an MCS Seminar (which would be scheduled during the regular colloquium time.)
- Have made a formal presentation of a proposed thesis topic to his/her Thesis Committee within one year of passing his/her Comprehensive Exam. The topic must be acceptable to the committee
- Write and defend (to his/her Thesis Committee) a dissertation, which embodies the results of his/her original research. In association with this work, the student must obtain at least 21,
but no more than 45, hours of thesis credit. The Thesis Committee consists of at least five Clarkson faculty members, of whom at least one is from another department.

- Complete a total of 90 hours graduate credit. The satisfaction of these requirements will be certified by the Thesis Committee.

**Program Length**
The typical length of the Mathematics MS program is two years and between five and six years for the PhD program.

**Faculty in Mathematics**
Professors Daniel ben-Avraham, Erik Bollt, Scott Fulton, Brian Helenbrook, Kathleen Kavanagh, Chris Lynch, Joseph Skufca, Tino Tamon; Associate Professor Sumona Mondal, Guohui Song, Jie Sun, Guangming Yao; Assistant Professors Kumudu Arachchi, Prashant Athavale, Marko Budisic, Ying He, Jonathan Martin, Diana White; Instructors Michael Felland, Christopher Martin, Sara Morrison.
Emeritus Professors Lawrence Glasser, Abdul Jerri, David Powers

**Physics Programs**
Prof. Dipankar Roy, Chair, Physics Department
droy@clarkson.edu

**Prerequisites Courses**
For both graduate degrees, undergraduate preparation is expected in the following subjects (at the levels of the textbooks indicated): Classical Mechanics (Symon or Becker); Quantum Mechanics (Anderson or Griffiths); Modern Physics (Krane); Thermal Physics (Baierlein or Kittel); Electricity and Magnetism (Griffiths, or Reitz, Milford and Christy); also recommended Optics (Bennett or Hecht), and fluency in data analysis and computer programming.

**MS in Physics**
The Master's program has a non-thesis option and a thesis option. To maintain qualification for study towards Master’s degree, the student must, no later than the end of the second semester of study, select a general topic of research-interest and find a research advisor. This requirement applies to both thesis- and non-thesis options.

30 credit hours are required as follows for the Master’s degree: At least 18 credits of coursework, including successful completion of appropriate courses from the PH661, PH663, PH669 sequence; at least 6 credits of thesis research in Physics, PH699; and at least 2 credits of seminar, including 1 credit of PH683 or PH684 (Graduate Seminar).

A minimum of 19 out of 30 credit hours must be taken in Physics (coursework, seminars, and thesis credits). Each Spring or Fall semester that they are registered for credit hours, those students who at the time receive any financial support via the University, such as full- or part-time teaching or research assistantship, tuition discount, etc., must take at least one credit of PH699.
**Thesis option:** Students are required to complete at least one of the following courses with a minimum grade of B: PH661, PH663 or PH669. **Non-thesis options:** Students are required to complete all 3 of the following courses with a minimum grade of B in each: PH661, PH663, PH669. The student’s advisor may authorize, with the approval of the Department Chair, replacement of at most one of these courses with another advanced Physics or other course appropriate for the student’s program (the grade requirement of B or above still applies). Non-thesis option students, who do not take and pass the Comprehensive Examination (usually taken as part of the Ph.D. track), must carry out a professionally oriented Special Project as part of their research (PH699) and coursework. The completion of the Project is verified by a Faculty Committee (as per University regulations) and certified by the student’s academic advisor in a notice to the Department Chair describing the Project’s topic.

**PhD in Physics**
To maintain qualification for study toward the Ph.D. beyond the first year, the student must, no later than the end of the second semester of study, select a general thesis topic and be assigned to a suitable research advisor. The appointment of the advisor must be approved by the Physics Department Chair. For interdisciplinary research projects to be supervised primarily outside the Physics Department, a physics co-advisor will be assigned to the student.

To maintain qualification for study toward the Ph.D. beyond the second year, the student must pass the Physics Comprehensive Examination and obtain at least a grade of B in each of these courses: PH661, PH663 and PH669. The comprehensive examination will generally consist of challenge and/or conceptual problems based on the knowledge of undergraduate materials in Physics and/or materials pertinent to the student’s expected thesis research topic. The problems will be composed by each member of a thesis committee. The thesis committee will be composed of five members including at least three from the Clarkson Physics Department and at least one from outside the Department. The committee will be selected by the student’s advisor and approved by the Department Chair and the Dean.

The student will have up to 30 days to submit written solutions, and will then have to defend his/her work in an oral examination before the thesis committee. The student’s advisor will coordinate the administration of the Comprehensive Exam, and the Physics Department should receive a copy of the full exam before the student receives the exam. The result of each exam (completion of the candidacy procedure or a failed attempt), should be reported by the advisor to the Physics Department and the Graduate School within one week of the thesis committee’s decision. Up to two attempts are allowed by University regulations.

By the end of the third year of study, to qualify for continuing in the Ph.D. program, the student is required to write a Ph.D. Research Proposal and defend the doctoral topic before a thesis committee. The proposal defense will consist of an oral presentation of the proposed thesis topic. The thesis committee members must be confirmed and they must receive copies of the student’s Research Proposal at least 10 working days before the oral defense. At the conclusion of the defense, the thesis committee must be satisfied that the thesis topic is of doctoral quality and that the student’s background is adequate to carry out the proposed research. A unanimous decision of the committee is required for passing.
Out of the total 90 credit hours for Ph.D., the specific Physics requirements for graduation include at least 33 credit hours of courses. The courses taken in Physics must include PH661, PH663, PH664, PH669, PH670. The requirement for PH664 and PH670 (passing grade) can be fulfilled any time during the study, and the student’s advisor can approve replacements of these two courses by other advanced graduate courses in the student’s chosen research field.

Each semester of full-time study in residence at Clarkson prior to the completion of 78 credits, the student must register for and obtain a passing grade in PH683 or PH684 (Graduate Seminar). Each Spring or Fall semester that they are registered for credit hours, those students who at the time receive any financial support via the University, such as full- or part-time teaching or research assistantship, tuition discount, etc., must take at least one credit of PH699. Oral presentation and defense of the written doctoral dissertation before a thesis committee are required. The thesis committee members must be confirmed, and must receive Research Proposal copies at least 10 working days before the oral defense.

Program Length
Typical length of the Physics M.S. Program is two years, although well-prepared students may find it possible to complete the requirements for the Master’s degree in an academic year. Doctoral candidates should expect to spend a minimum of two years beyond the Master’s in meeting degree requirements. Typical length of the Physics Ph.D. Program varies between five and six years.

Faculty in Physics
Professors Danial ben-Avraham, Erik Bollt (courtesy appointment), Ming-Cheng Cheng (courtesy appointment), Lawrence Glasser (Emeritus), Dipankar Roy, Lawrence Schulman; Associate Professors Maria Gracheva, Michael Ramsdell, Jie Sun; Assistant Professors Dmitriy Melnikov, Jan Scrimgeour, Joshua Thomas; Research Professor Vyacheslav Gorshkov; Research Associate Professor David Wick.
The David D. Reh School of Business offers the following graduate programs:

- Master of Business Administration (MBA)
- Master of Business Administration-Healthcare Management (MBA)
- Master of Science in Healthcare Data Analytics (MS)
- Master of Science in Clinical Leadership (MS)

The programs offer a variety of options in terms of both mode of delivery (classroom, online, or a mix of classroom and online chosen by the student) and time of completion (full time or part time).

The MBA program consists of three programs – the Residential MBA, the Online MBA, and the Hybrid MBA. The Residential MBA is offered at the Potsdam campus. All classes are taken in the classroom and follow the semester calendar. The Online MBA and the Hybrid MBA have the same curriculum and follow the same quarter calendar (four terms per year). The Hybrid MBA allows students to freely mix online and classroom courses to meet their own needs. The classroom courses are offered in the evening at the Capital Region Campus (CRC) in Schenectady. The mix can be fully online, fully classroom, or anything in between.

The Healthcare MBA program follows the quarter calendar and can be completed online, in the classroom, or utilizing any mix to meet the individual student’s needs. The classroom classes are offered in the evening at the CRC.

The Master of Science in Healthcare Data Analytics is an online program and follows the quarter calendar.

The Master of Science in Clinical Leadership follows the quarter calendar and can be completed online, in the classroom, or utilizing any mix to meet the individual student’s needs. The classroom courses are offered in the evening at the CRC.

No specific undergraduate major is required for admission; however, applicants must demonstrate high promise for success as indicated by several components of student’s application profile which include (but is not limited to) undergraduate grade point average, score on GMAT or the GRE, work experience, and references. Students with extensive work experience may be considered for admission without GMAT or GRE. Qualified students may also follow the Certificate Pathway to admission by completing the Business Fundamentals Certificate (for admission to the Hybrid or Online MBA) or the Healthcare Management Certificate (for admission to the Healthcare MBA). The Certificate Pathway allows students to gain admission based on performance in certificate courses without requiring the GMAT or GRE.

A typical graduate class includes recent college graduates, people with work experience, and men and women from many geographic regions of the world. The breadth and diversity of the student
body serve to enrich the educational experience. Merit based scholarships are awarded on a competitive basis. Full time residential MBA students are also eligible to apply for a graduate assistant position working with a faculty/staff member. Faculty and students also participate in the interdisciplinary Data Analytics and Environmental Policy and Governance graduate programs. More information can be found in the section for Institute for a Sustainable Environment and the Interdisciplinary Program sections of the catalog.

The David D. Reh School of Business at Clarkson 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. In addition, the Healthcare Management MBA is accredited by the Commission on the Accreditation of Healthcare Management Education (CAHME).

The Master of Business Administration (MBA) Programs

Christopher Wszalek, Director
cwszalek@clarkson.edu

The MBA degree is meant to provide students with the skills to be effective business leaders. At Clarkson, there are four MBA programs to choose from – the Residential MBA at the Potsdam campus, the Online MBA, the Hybrid MBA where students can freely mix classes at the Capital Region (Schenectady) Campus with online classes (shared with the Online MBA), and the MBA in Healthcare Management, which also allows students to freely mix classes at the Capital Region Campus with online classes. Although the MBA programs offer distinct choices, all programs share the hallmarks of a Clarkson MBA small class sizes and close student interaction with renowned faculty.

Residential MBA

The Residential MBA consists of foundation courses in ten specified areas and 38 credit hours of advanced graduate work. The foundation includes courses from the following subjects: financial and managerial accounting, information technology, corporate finance, microeconomics, macroeconomics, ethics, organizational behavior, marketing, operations and production management, quantitative methods/statistics. Students with undergraduate business majors will waive most or all of the foundation. Through careful planning, students with backgrounds in engineering, liberal arts, or science may complete the foundation courses as part of an undergraduate minor or through pursuing the Summer Business Concepts program offered online in the summer, preceding the start of the regular Fall semester. Articulation agreements, which specify acceptable foundation courses, exist for Clarkson’s engineering and science programs and a number of universities in the United States and Canada.

Beyond the foundation, the 38 credits of the Residential MBA degree program consist of ten two-credit interrelated core modules, five three-credit graduate elective courses, and a three credit experiential course. The core modules stress business functions, emphasizing the development of communication, interpersonal, and managerial skills.
The core module titles are:
AC603   Management Accounting
OM606   Supply Chain Management
EC604   Applied Economics
OS608   Organizational Behavior & Performance Management
FN607   Financial Management
OS610   Strategic Planning
S605    Information Systems
MK609   Marketing Management
OM602   Decision Analysis and Supply Chain Modeling
SB609   Corporate Ethical Decision Making

A Strategic Planning module (2 credits) is offered as a 12 week course during the spring term or as an accelerated interim term on-line course. The other modules are taught for seven weeks each during the fall term.

Graduate elective courses in the residential program are available in several functional areas, and they include:
AC623   Financial Statement Analysis
AC636   Auditing
AC648   Seminar in Accounting Information Systems and Auditing
AC650   Accounting Research and Theory
EC660   Environmental Economics
EC651   Industrial Organization in Supply Chain
FN655   Venture Capital and Private Equity
FN672   Investments
FN680   Strategic Financial Management
IS629   Global Outsourcing of Information Systems and Services
MK689   New Product Marketing
MK696   Marketing Methods
OM676   Developing and Managing Technology
OM680   Strategic Project Management
OM685   Quality Management and Process Improvement
OM671   Supply Chain Environmental Management
OS657   Leading Organizational Change
OS666   Negotiations and Relationship Management
SB611   Clarkson Consulting Group
SB658   Bridging the Innovation Gap
SB678   Inventive Practices
SB693   Seminar in International Business
SB696   Advanced Topics in Supply Chain Management

In the course of their Residential MBA program of study, students may earn a by taking a certain set of electives as determined by the requirements of each certificate. Please contact the Reh School for additional information.
Experiential learning is a strong part of Clarkson's culture so each student participating in the Residential MBA program is required to take a three credit hour experiential course. Currently, the experiential requirement can be satisfied by participating in global business program, or by taking the SB696 Global Business Strategies course. Through the Global Business Programs, there are several options that are designed to give you knowledge and new perspectives regarding international business, helping you develop critical skills necessary to compete and succeed in the global market. The most popular Global Business Program option is the course that includes a 2-3 week trip to an international destination, often led by the faculty from that area. This course offers a unique opportunity to explore business outside the traditional classroom boundaries and to provide a unique experience to your resume. This course also helps students explore the global management issues facing business leaders and organizations in different parts of the world.

**Length of Program**
There are three length-of-study options for the Residential MBA program:
1. The Accelerated One-Year study plan, with all 38 credits completed over the course of two consecutive semesters
2. One and one half years study plan with core modules and electives completed over the three consecutive semesters
3. Two years, with core modules and electives completed over the four consecutive semesters

While most students begin the Residential MBA program in the fall semester, spring starts can be accommodated. Students starting in the spring have their choices of elective courses in that first semester limited to those that do not have core modules as pre-requisites, and the Strategic Planning module cannot be taken during the first spring semester.

**The Residential Master of Business Administration – Global Specialty Track with one semester abroad at one of the partner AACSB accredited schools**
The Global Specialty Track residential MBA follows the same curriculum structure and has the same foundation requirements as the regular Residential MBA program, with students completing up to six courses over the spring semester at one of the partner institutions. The courses taken at the partner institutions need to be approved by the Graduate David D. Reh School of Business as elective courses and/or a substitute course for the Strategic Management core module. Students are allowed to participate in the Global track if they achieve satisfactory performance in the first set of core MBA modules as determined by the Graduate David D. Reh School of Business.

The current choices of AACSB accredited partner institutions include the Bordeaux School of Management, in Bordeaux, France and Griffith University, in Brisbane, Australia. These elective classes meet the elective requirement and experiential unit requirement of the Residential MBA program. Students starting in the spring semester cannot participate in the Global Track program in their first semester.

**Online MBA Program**
The online MBA program is a 48 credit hour program (a total of 16 three credit courses). This program is designed to be completed part time, taking up to two courses during each of the four 11-week periods. Maximum time to complete the program will be five years. All students are required to take eleven (three credit hours each) MBA core courses. The remaining 15 credits are comprised of five elective courses.

Students with extensive prior academic work in specific subjects may reduce the number of courses required by waiving or transferring courses. Course waivers may be based on undergraduate or graduate work and apply only to required courses. Transfers must be graduate courses not used as part of another degree and may apply to required or elective courses. Program requirements may be reduced by up to nine credit hours (from 48 to 39) with course waivers alone. Program requirements may be reduced by up to twelve credit hours (from 48 to 36) with a combination of course waivers and transfers. Articulation agreements have been established with a number of universities in the United States and Canada. These agreements specify which combinations of undergraduate classes at the partner schools will allow courses in the online MBA program at Clarkson to be waived.

The course numbers and titles for the required courses in the on-line program are:

- AC604  Financial and Managerial Accounting for Decision Making
- OM607  Global Supply Chain Management
- EC605  Managerial Economics
- FN608  Financial Management
- OS681  Strategic Management
- IS606  Business Information Systems
- MK610  Marketing Management
- OM603  Decision Analysis and Supply Chain Modeling
- SB610  Corporate Ethical and Social Responsibility
- OS603  Leadership and Organizational Behavior
- IS647  Statistical Methods for Data Analytics

Graduate elective courses in the on-line MBA program include:

- EC652  Industrial Organization in Supply Chain
- OM681  Strategic Project Management
- OM686  Quality Management and Process Improvement
- OS656  Leading Organizational Change
- OS667  Negotiations and Relationship Management
- SB640  Advanced Topics in Supply Chain Management
- OS654  Labor Relations
- SB651  Communicating Globally

**Program Length**

Full time students can complete the program in as little as one year; part-time students complete in two to five years with an average completion of three years.
Hybrid MBA Program (Flexible Mix of Evening Courses at CRC and Online Courses)
The Hybrid MBA program is a 48 credit hour program (a total of 16 3-credit courses) with the exact same curriculum as the Online MBA program described above. Students may choose to take all their classes in the evening onsite at the Capital Region Campus or mix in any number of online classes they want. It is totally up to the individual student to choose. Onsite and online courses follow exactly the same calendar so that students may take a mix of online and onsite courses in the same term as well as across terms. The Hybrid MBA has a strong internship program that students find extremely valuable. An internship is required but may be waived for students with relevant business experience.

As with the Online MBA program, students with extensive prior academic work in specific subjects may reduce the number of courses required by waiving or transferring courses. Course waivers may be based on undergraduate or graduate work and apply only to required courses. Transfers must be graduate courses not used as part of another degree and may apply to required or elective courses. Program requirements may be reduced by up to nine credit hours (from 48 to 39) with course waivers alone. Program requirements may be reduced by up to twelve credit hours (from 48 to 36) with a combination of course waivers and transfers. Articulation agreements have been established with a number of universities in the United States and Canada. These agreements specify which combinations of undergraduate classes at the partner schools will allow courses in the online MBA program at Clarkson to be waived.

In addition to the online electives that are available to Hybrid MBA students, electives available onsite at the Capital Region Campus may be found on the Student Administrative website in the University Course Catalog.

Clarkson 4+1 Articulation Agreements: MBA Residential, Online, and Hybrid Programs
Clarkson has “4+1” articulation agreements with a number of colleges and universities in the United States and Canada. These agreements enable students to fulfill the business foundation requirements of the Residential MBA as undergraduates or to waive up to three courses from the MBA Online or Hybrid program, reducing the number required to complete the program from 16 to 13. Students from any undergraduate discipline can participate in these 4+1 programs by carefully selecting appropriate foundation courses as undergraduates. For further information about specific foundation requirements at our 4+1 partners, please visit our Web site at www.clarkson.edu/business/graduate.

MBA – Healthcare Management Program
John Huppertz, Director
jhuppert@clarkson.edu

The primary purpose of the MBA Program in Healthcare Management is to prepare its graduates for management positions in health service delivery organizations (e.g. hospitals, managed care organizations, group practice, long-term care) and in related organizations (e.g. consulting, government, corporate benefits). A successfully prepared graduate will be able to obtain a
professional management position in a healthcare organization, competently perform the duties of that position, and advance and grow professionally in a career.

The program serves students with diverse educational backgrounds and work experiences fully supporting and encouraging those with limited or no clinical and managerial experience who matriculate on both a part-time and full-time basis. The program provides its education in an environment that fosters a high level of interaction among and between students and faculty, both in and out of the classroom. Faculty and students value this small-class environment.

The MBA–Healthcare Management program is a 48 credit hour program (a total of 16 3-credit hour courses). The program includes seven required core courses and nine advanced courses (seven required; two elective). As with the Online and Hybrid MBA programs, students with extensive prior academic work in specific subjects may reduce the number of courses required by waiving or transferring courses. Course waivers may be based on undergraduate or graduate work and apply only to required courses. Transfers must be graduate courses not used as part of another degree and may apply to required or elective courses. Program requirements may be reduced by up to nine credit hours (from 48 to 39) with course waivers alone. Program requirements may be reduced by up to twelve credit hours (from 48 to 36) with a combination of course waivers and transfers.

The Healthcare MBA has a strong internship program and an internship is required. This requirement may be waived for students with relevant business experience.

The seven required core courses are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AC604</td>
<td>Financial and Managerial Accounting for Decision Making</td>
</tr>
<tr>
<td>HC600</td>
<td>Introduction to Health Systems</td>
</tr>
<tr>
<td>HC605</td>
<td>Healthcare Operations</td>
</tr>
<tr>
<td>HC626</td>
<td>Healthcare Marketing</td>
</tr>
<tr>
<td>HC651</td>
<td>Health Systems Management</td>
</tr>
<tr>
<td>HC657</td>
<td>Healthcare Leadership Proseminar</td>
</tr>
<tr>
<td>IS647</td>
<td>Statistical Methods for Data Analytics</td>
</tr>
</tbody>
</table>

The seven required advanced courses are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC617</td>
<td>Healthcare Finance</td>
</tr>
<tr>
<td>HC620</td>
<td>Healthcare Economics</td>
</tr>
<tr>
<td>HC648</td>
<td>Health Informatics</td>
</tr>
<tr>
<td>HC650</td>
<td>Structural Dynamics in Healthcare</td>
</tr>
<tr>
<td>HC674</td>
<td>Legal Aspects of Healthcare</td>
</tr>
<tr>
<td>HC680</td>
<td>Healthcare Policy and Managerial Epidemiology</td>
</tr>
<tr>
<td>HC681</td>
<td>Strategic Issues for Healthcare Organizations (Health Capstone)</td>
</tr>
</tbody>
</table>

Two electives can be chosen from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC601</td>
<td>Swiss Healthcare Study Tour</td>
</tr>
<tr>
<td>HC607</td>
<td>Healthcare Operations Research</td>
</tr>
<tr>
<td>HC656</td>
<td>Group Practice Administration</td>
</tr>
</tbody>
</table>

Any elective offered as part of the Hybrid MBA program
Program Length
With no prior educational background in business, the program can be completed in as little as two years. Full time students complete in one year, part-time students complete in two to five years with an average completion of three years.

Completing both the MBA – Healthcare Management and the MS – Healthcare Data Analytics
Students may complete both the MBA-Healthcare Management and the MS-Healthcare Data Analytics programs by taking a total of 24-three credit courses rather than the aggregate total of 29 courses for the two programs taken separately. This is made possible by shared courses and synergies between the programs.

Healthcare Data Analytics MS
Peter Otto, Director
potto@clarkson.edu

The purpose of the MS - Healthcare Data Analytics program is to prepare students with the skills to acquire, interpret and communicate healthcare data to shape the direction of the healthcare industry. Graduates will be prepared to take positions in healthcare organizations that require them to analyze high volumes of clinical, administrative and financial data. The program is fully online with a single weekend onsite component required for two of the courses. The MS – Healthcare Data Analytics program is a 36 credit hour program (a total of 12 3-credit hour courses). The program includes nine required core courses and three electives. As with the Online and Hybrid MBA programs, students with extensive prior academic work in specific subjects may reduce the number of courses required by waiving or transferring courses. Course waivers may be based on undergraduate or graduate work and apply only to required courses. Transfers must be graduate courses not used as part of another degree and may apply to required or elective courses. Program requirements may be reduced by up to six credit hours (from 36 to 30) with any combination of course waivers and transfers.

The nine required core courses are:
HC600 Introduction to Health Systems
HC602 Advanced Statistics and Data Visualization
HC603 Data Architecture
HC610 Healthcare Accounting and Finance
HC642 Data Analytics and Business Intelligence
HC647 Statistical Foundations of Data Analytics
HC648 Health Informatics
HC657 Healthcare Leadership Proseminar
HC643 Advanced Applications in Data Analytics

Three electives can be chosen from:
HC604 Hospital Analytics
Program Length
Part-time students complete in one to two years

Completing both the MBA – Healthcare Management and the MS – Healthcare Data Analytics
Students may complete both the MBA-Healthcare Management and the MS-Healthcare Data Analytics programs by taking a total of 24-3 credit courses rather than the aggregate total of 29 courses for the two programs taken separately. This is made possible by shared courses and synergies between the programs.

Clinical Leadership MS
John Huppertz, PhD., Associate Professor and Director
jhuppert@clarkson.edu

The MS in Clinical Leadership degree is designed for current and future clinical practitioners: physicians, nurses, pharmacists, therapists, and other healthcare professionals who wish to better understand the healthcare industry and the environment in which it exists, or who aspire to clinically-related leadership roles. The goal of the program is to broaden the horizons of students by providing them with knowledge and skills in health policy and health management. The MS in Clinical Leadership is a 36 credit program (a total of 12 3-credit courses). There are eleven required courses and one elective course. The eleven required courses are:
AC604 Financial and Managerial Accounting for Decision Making
HC600 Introduction to Health Systems
HC605 Healthcare Operations
HC617 Healthcare Finance
HC620 Healthcare Economics
HC651 Health Systems Management
HC656 Group Practice Administration
HC674 Legal Aspects of Healthcare
HC680 Healthcare Policy and Managerial Epidemiology
HC681 Strategic Issues for Healthcare Organizations (Capstone)
IS647 Statistical Methods for Data Analytics

The elective may be any Healthcare or Hybrid MBA elective.
Program Length
Part-time students may complete the program in two to three years.

Joint Programs: Clarkson University Capital Region Campus
The Clarkson University David D. Reh School of Business Capital Region Campus has several joint programs with organizations located in the Capital Region. These programs are described in the following sections.

Accelerated BA or BS at Union College and MBA Program (with Union College)
Union College students considering entrance into the accelerated Bachelor’s/MBA program should consult with an MBA program advisor and apply for admission during the sophomore, junior, or first term of the senior year. Joint degree students must complete sixteen graduate courses, three of which may, with undergraduate advisor approval, count toward Bachelor’s degree requirements. Graduate courses may not be taken until the junior year and are typically completed during the senior and fifth years. Students may choose either the MBA or the MBA in Healthcare Management degree. There is a limit of five undergrads in each graduate level course.

Four-Year JD/MBA Program (with Albany Law School)
This program is designed to meet the management development goals of students enrolled at Albany Law School (ALS). Students spend their first year in law studies, their second year in management studies, and their third and fourth years in law and management studies. Three designated law courses transfer into the MBA degree. Students are required to complete their MBA the winter term of the year they petition to graduate at ALS. Students may choose either the MBA or the MBA in Healthcare Management degree.

Joint PharmD /MBA in Healthcare Management
(with Albany College of Pharmacy and Health Sciences, ACPHS)
John Huppertz, Ph.D. Associate Professor and Chair
jhuppert@clarkson.edu

The MBA in Healthcare Management degree is a 16 course program. Three designated Pharmacy courses transfer into the MBA degree, reducing the number of MBA courses in the PharmD/MBA joint program to 13. In addition, PharmD students may meet the MBA Internship Requirement with the selected practicum experiences which are part of the PharmD program 6th year curriculum at ACPHS. Most joint program students complete the MBA course requirements on a part-time basis over a three year period (years 4-6 at ACPHS).

Joint BS Pharmaceutical Science /MBA in Healthcare Management
(with Albany College of Pharmacy and Health Sciences)
John Huppertz, Ph.D. Associate Professor and Chair
jhuppert@clarkson.edu
The MBA in Healthcare Management degree is a 16 course program. The BS/MBA in Healthcare Management joint program reduces the number of MBA courses needed from 16 to 13. Up to three required courses from the MBA curriculum are waived based on courses taken in the BS program at ACPHS. The remaining courses are usually completed on a full-time basis the year following graduation from ACPHS. In addition to coursework, all BS/MBA students are required to complete an administrative internship.

**Joint PharmD / MS in Clinical Leadership**  
(with Albany College of Pharmacy and Health Sciences)  
*John Huppertz, Ph.D. Associate Professor and Chair*  
[jhuppert@clarkson.edu](mailto:jhuppert@clarkson.edu)

The MS in Clinical Leadership is a 12 course program. The PharmD/MS joint program reduces the number of required MS courses to 9. Up to three required courses from the MBA curriculum are waived based on courses taken in the PharmD program at ACPHS.

**Joint BS Pharmaceutical Science /MS in Clinical Leadership**  
(with Albany College of Pharmacy and Health Sciences)  
*John Huppertz, Ph.D. Associate Professor and Chair*  
[jhuppert@clarkson.edu](mailto:jhuppert@clarkson.edu)

The MS in Clinical Leadership is a 12 course program. The PharmD/MS joint program reduces the number of required MS courses to 9. Up to three required courses from the MBA curriculum are waived based on courses taken in the BS program at ACPHS.

**Leadership in Medicine (LIM) / MBA in Healthcare Management**  
(with Union College and Albany Medical College)  
*John Huppertz, Ph.D. Associate Professor and Chair*  
[jhuppert@clarkson.edu](mailto:jhuppert@clarkson.edu)

Students in the eight-year LIM program jointly offered by Union College, Albany Medical College and Clarkson University earn a BS from Union College, an MBA in Healthcare Management from Clarkson University, and an MD from Albany Medical College. The MBA in Healthcare Management degree is a 16 course program. Students choosing this option take graduate MBA courses while fulfilling all other requirements of the program at Union College and Albany Medical College throughout the eight years of the program. During the four years in residence at Union College, students pay tuition based on degree requirements for a BS degree from Union College and an MS degree in Clinical Leadership from Clarkson. There is an additional charge for the LIM MBA degree. Students choosing the BS/MBA/MD option pay for four additional MBA courses they take at Clarkson University at the graduate tuition rate in effect in the student’s spring term of senior year of undergraduate study.
Students in this program must meet admission requirements of Union College, Clarkson University, and Albany Medical College.

The LIM MBA in Healthcare Management requires 16 courses plus an internship as listed below:

**Program Requirements:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>AC604</td>
<td>Financial and Managerial Accounting for Decision Making</td>
</tr>
<tr>
<td>HC605</td>
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<tr>
<td>HC626</td>
<td>Healthcare Marketing</td>
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<tr>
<td>HC651</td>
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<tr>
<td>HC617</td>
<td>Healthcare Finance</td>
</tr>
<tr>
<td>HC630</td>
<td>Introduction to Health Systems</td>
</tr>
<tr>
<td>HC633</td>
<td>Healthcare Leadership</td>
</tr>
<tr>
<td>HC634</td>
<td>Health and Human Values I</td>
</tr>
<tr>
<td>HC635*</td>
<td>Economics of Health (*or HCM 620, Health Economics)</td>
</tr>
<tr>
<td>HC648</td>
<td>Health Informatics</td>
</tr>
<tr>
<td>HC656</td>
<td>Group Practice Management</td>
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<tr>
<td>HC684</td>
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</tr>
<tr>
<td>IS647</td>
<td>Statistical Methods for Data Analytics</td>
</tr>
<tr>
<td>Elective</td>
<td>An elective</td>
</tr>
</tbody>
</table>

An approved internship is required for the MBA in Healthcare Management. HC637 Clinical Leadership Practicum fulfills the internship requirement.

**Additional Cost**

Students who elect to take the additional courses to achieve an MBA will be charged additional tuition by Clarkson University:

- three courses tuition- Spring of Senior Year
- one course tuition- Summer following Senior year

**Leadership in Medicine (LIM) / MS in Clinical Leadership**

*John Huppertz, Ph.D. Associate Professor and Chair*

*huppert@clarkson.edu*

Students in the eight-year LIM program jointly offered by Union College, Albany Medical College and Clarkson University might earn an MS in Clinical Leadership from Clarkson University. The MS in Clinical Leadership degree is a 12 course program. Students choosing this option take graduate Healthcare Management courses while fulfilling all other requirements of the program at Union College and Albany Medical College throughout the eight years of the program. Students choosing this option take additional courses while fulfilling all other requirements of the program. Students in this program must meet admission requirements of Union College, Clarkson University, and Albany Medical College.
The LIM MS in Clinical Leadership requires 12 courses listed below:

**Program Requirements:**

<table>
<thead>
<tr>
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</thead>
<tbody>
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<td>HC684</td>
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</tr>
<tr>
<td>IS647</td>
<td>Statistical Methods for Data Analytics</td>
</tr>
<tr>
<td>HC637</td>
<td>Clinical Leadership Practicum</td>
</tr>
</tbody>
</table>

**Joint MD/MBA in Healthcare Management**

*(with Albany Medical College)*

*John Huppertz, Ph.D. Associate Professor and Chair*

jhuppert@clarkson.edu

The Clarkson University MBA in Healthcare Management/Albany Medical College MD is designed to provide students with a business understanding specific to healthcare and move them on to their medical education quickly. While many other medical schools offer a generic MBA, the Clarkson University MBA in Healthcare Management is focused on the healthcare environment. Students study alongside others with a passion for healthcare, and learn how to manage a medical practice, deliver quality care in a cost-containment environment, market a practice, and lead other healthcare professionals.

Joint degree students are first admitted to Albany Medical College and then apply separately to Clarkson University. Once admitted to both institutions, they defer the start of medical school by one year and spend one year at Clarkson University working on MBA courses. The second through fifth years are spent completing the MD degree requirements at Albany Medical College. The combined programs allow students to “double count” courses which reduces the total time and cost associated with completing the two degrees separately. Four courses taken at Albany Medical College are transferred back to Clarkson University to meet MBA requirements. The combined degree is typically completed in five years.

It is possible to join the joint degree program after the start of medical school. Students using this option apply for leave from medical school at the end of their third year and spend 13 months at Clarkson University completing MBA course requirements. They return to medical school for their final year.

**Certificates of Advanced Study – Online and Capital Region Campus**
Objectives
The purpose of the Clarkson University Certificate Programs is to allow professionals currently working in a field or wanting to enter a field to conduct intensive study in that field in an efficient and focused manner. Upon completion, students should be able to function more effectively in their specific fields. The Certificate Programs are not designed to provide the broad management background of an MBA. If students wish to expand their management skills they may apply all of the courses taken in any certificate program toward the MBA. All Certificates are approved by the NYS Education Department.

Certificate Pathway to MBA Admission
Qualified students may follow the Certificate Pathway to admission by completing the Business Fundamentals Certificate (for admission to the Hybrid or Online MBA) or the Healthcare Management Certificate (for admission to the Healthcare MBA). The Certificate Pathway provides automatic admission based on performance in Certificate courses and does not require a GMAT or GRE test.

Certificate 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 process, and includes raw material sourcing, logistics, and continues through the delivery of that product or service to the end customer, with a goal of creating customer satisfaction at optimal cost. The Certificate requires four courses. Completion of these courses allows individuals to be productive in this important area and can provide a strong concentration should the individual decide to continue on for an MBA.

Required Courses:
- Global Supply Chain Management \( OM607 \)
- Advanced Topics in Supply Chain Management \( SB640 \)

Specialty Courses (two):
- Quality Management and Process Improvement \( OM686 \)
- Negotiations and Relationship Management \( OS667 \)
- Industrialization Organization in the Supply Chain \( EC652 \)

Certificate in Human Resource Management
The Certificate Program in Human Resource Management will provide the educational background necessary to make informed decisions in management as related to human resource issues. The certificate holder will have the resources for strategic critical thinking necessary to optimize the human resources of an organization.
Required Courses:
Leadership and Organizational Behavior  OS603
Human Resource Management Systems  OS675
Current Issues in Human Resource Management  OS676

Specialty Courses (three):
International Human Resources  OS677
High Performance Leadership  OS651
Leading Organizational Change  OS656
Women and Management  OS659
Labor Relations  OS654
Competing by Design  OS650
Executive Decision Processes in Dynamic Environments  OS660
MBA Elective
Certificate in Management and Leadership

The Certificate in Management and Leadership is designed to give entry and middle level managers the core business skills in organizational processes, change management, resource management and leadership. It is focused on assisting managers and executives in enhancing their management and leadership skills in order to positively affect their current organization and provide them career advancement potential.

**Required Courses:**
- Leadership and Organizational Behavior (OS603)
- High Performance Leadership (OS651)

**Specialty Courses (four):**
- Financial and Managerial Accounting for Decision Making (AC604)
- Executive Decision Processes in Dynamic Environments (OS660)
- Leading Organizational Change (OS656)
- Women and Management (OS659)
- Current Issues in Human Resource Management (OS676)
- MBA Elective

Certificate in Healthcare Management

Healthcare has become one of the fastest growing industries in the US economy, characterized by rapid change and a need for management that will extend into the foreseeable future. The Certificate in Healthcare Management prepares individuals to take advantage of the opportunities in this field by introducing them to important business concepts applied to healthcare. Students may complete this certificate following the Certificate Pathway to gain automatic admission to the Healthcare MBA.

**Required Courses:**
- Introduction to Health Systems (HC600)
- Health Systems Management (HC651)

**Specialty Courses (four):**
- Health Operations Management (HC605)
- Proseminar in Healthcare Leadership (HC657)
- Health Systems Marketing (HC626)
- Healthcare Finance (HC617)
- Health Economics (HC620)
- Health Informatics (HC648)
- Structural Dynamics in Healthcare Systems (HC650)
- Group Practice Administration (HC656)
- Legal Aspects of Healthcare (HC674)
- Health Policy & Managerial Epidemiology (HC680)
- Statistical Methods for Data Analytics (IS647)
- Financial and Managerial Accounting for Decision Making (AC604)
- Human Resource Management Systems (OS675)
Certificate in Business Fundamentals
The Certificate in Business Fundamentals is designed to provide non-business undergraduate majors working in businesses with an opportunity to develop a broad background in the fundamental areas of business without committing to a full MBA. This certificate may be completed entirely online or entirely in classes at the Schenectady campus or students may mix online and on campus evening classes. Students may complete this certificate following the Certificate Pathway to gain automatic admission to the Hybrid MBA.

Required Courses:
- Financial and Managerial Accounting for Decision Making (AC604)
- Financial Management (FN608)
- Business Information Systems (IS606)
- Marketing Management (MK610)
- Global Supply Chain Management (OM607)
- Leadership and Organizational Behavior (OS603)

Certificate Program Length
Most candidates complete their certificate program in 9 months to 1.5 years.

The Reh Center for Innovation and Entrepreneurship
A resource center located within the Clarkson University David D. Reh School of Business, the Entrepreneurship Center helps small business owners and entrepreneurs develop and manage sustainable micro enterprises through partnerships with universities and government support programs.

The Center builds upon the University's nationally recognized expertise in entrepreneurial education and long-standing commitment to boost regional economies through small business development.

The goal of the Center is to serve as a national model for enhancing regional economic development by focusing on micro enterprises. Additionally, increased hands-on learning opportunities provide students with tremendous learning opportunities in marketing, management and finance.

Faculty for the David D. Reh School of Business

Consumer and Organizational Studies

Economics and Financial Studies
Profs. Diego Nocetti; Asst. Professors Bebonchu Atems, John DeJoy Luciana Echazu, Zhilan Feng, Martin Heintzelman, Alasdair Turnbull, Allan Zebedee; Assoc. Professors, Joseph Andriano, Wentao Wu
Instructors Gasper Sekelj
Engineering & Management
Professor Michelle Crimir; Associate Professor R. John Milne, Assistant Professor H. Cecilia Martinez Leon, Golshan Madraki, Seyedamirabbas Mousavian, Ha Ta, Instructor Marshall Issen

Healthcare Management
Professors Jim Lambrinos, Associate Professors John Huppertz, Peter Otto; Assistant Professors Amber Stephenson; Participating Professors Jim Gavin, Rob Smith, Carl Strang

Operations and Information Systems
Professors Alan Bowman, Boris Jukic, Weiling Ke, Farzad Mahmoodi; Associate Professors Santosh Mahapatra, Somendra Pant, Dennis Yu; Assistant Professors William MacKinnon, Chester Xiang, Jane Oppenlander; Participating Professors Bret Kauffman, Instructors Jesse Sherman
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.”

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 funded five key areas: team project-based learning activities; endowed chairs and endowed fellowships; new programs in 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 Aeronautical Engineering.

**Graduate Programs in Engineering**

The Coulter School of Engineering offers Master of Science, Master of Engineering, and Doctor of Philosophy degrees in each department. There is also an interdisciplinary Engineering Science graduate program managed by the Dean of the School of Engineering. Faculty and students also participate in the interdisciplinary Data Analytics, Environmental Science and Engineering, and Materials Science and Engineering graduate programs. More information can be found in the section for Institute for a Sustainable Environment and the Interdisciplinary Program sections of the catalog.
The graduate programs are designed to prepare students for careers in research, development, design, and education. Admission to graduate study will be granted to qualified applicants who hold a baccalaureate degree in engineering from an accredited institution or who have equivalent qualifications.

**Programs Length in School of Engineering**
- PhD program students complete up to seven years after they pass the qualifying exam
- MS students complete within five years
- ME students complete within one year

**Chemical and Biomolecular Engineering Graduate Programs**

*Professor Elizabeth Podlaha-Murphy, Department Chair*
epodlaha@clarkson.edu

*Professor Shunsuke Nakao, Graduate Committee Chair*
snakao@clarkson.edu

Graduate education in Chemical and Biomolecular Engineering (ChBE) concentrates in the following specialties:
- Functional Polymers and Nanocomposites
- Electrochemical Processing
- Energy Technologies
- Aerosols and its impact on the Environment
- Multi-component Mass Transfer Separations
- Molecular Simulations
- Membrane Separations

**Requirements for the Master of Science (MS) Degree in Chemical Engineering**

**Prerequisites**
BS or BE in chemical engineering. Those with degrees in other science or engineering disciplines may also be admitted, but will be required to make up undergraduate course deficiencies

**Prerequisite Courses**
CH210, CH220, CH260, CH320, CH330, CH350, CH360, CH370, CH410

**Program Length**
Two calendar years (24 months) for those with a BS or BE in chemical engineering

**Degree Requirements**
1. The following are required courses:
   - CH546 Chemical Reactor Analysis II
   - CH560 Transport Phenomena
   - CH561 Chemical Engineering Analysis
• CH571 Advanced Chemical Engineering Thermodynamics

2. Two additional three-credit hour technical graduate courses selected in consultation with the student’s advisor. David D. Reh School of Business courses cannot be taken to satisfy this requirement.

3. Two credit hours of CH610 (Seminar). (While in residence, all students are required to attend seminar, whether they are registered for CH610 or not.)

4. Ten credit hours of CH611 Thesis. All students are expected to start their thesis research at the beginning of their first semester in residence.

5. The MS thesis must be orally presented and defended before a committee of three or more faculty members, at least two of whom are from the Department. A typical schedule follows. Individuals with an undergraduate degree in chemistry or physics have a different schedule - refer to “Requirements for the MS degree in Chemical Engineering for BS Chemists and Physicists” on the next page.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 three-credit courses</td>
<td>3 three-credit courses</td>
</tr>
<tr>
<td>5 credits of thesis</td>
<td>5 credits of thesis</td>
</tr>
<tr>
<td>1 credit of seminar</td>
<td>1 credit of seminar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Semester (if necessary)</th>
<th>Fourth Semester (if necessary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 credit of thesis</td>
<td>1 credit of thesis</td>
</tr>
</tbody>
</table>

The Master of Science is a thesis-based degree; each student is required to complete and defend a research-based thesis.

Requirements for the MS Degree For BS Chemists and Physicists

A program is available for qualified BS chemists and physicists that will permit them to earn an MS in Chemical Engineering in four semesters. During the course of study, the student will take almost all the required courses in the chemical engineering undergraduate curriculum, as well as the chemical engineering graduate level courses required for the MS program.

A typical program, which may be altered depending on the background of the student, is illustrated below:

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses</td>
<td>Courses</td>
</tr>
<tr>
<td>CH501 Directed Study in Chemical Engineering Principles I (CH220, CH320, CH330)</td>
<td>3 CH502 Directed Study in Chemical Engineering Principles II (CH260, CH360, CH370)</td>
</tr>
<tr>
<td>CH561 Chemical Engineering Analysis</td>
<td>3 CH571 Advanced Chemical Engineering Thermodynamics</td>
</tr>
<tr>
<td>Graduate Elective</td>
<td>3 Graduate Elective</td>
</tr>
<tr>
<td>CH610 Seminar</td>
<td>1 CH610 Seminar</td>
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</tbody>
</table>


### Requirements for the ME Degree in Chemical Engineering

#### Prerequisites
BS or BE in chemical engineering. Those with degrees in other science or engineering disciplines may also be admitted, but will be required to make up undergraduate course deficiencies.

#### Prerequisite courses
CH210, CH220, CH260, CH320, CH330, CH350, CH360, CH370, CH410

#### Program Length
One calendar year (12 months) for those with a BS or BE in chemical engineering.

#### Degree Requirements

1. Two graduate courses (6 credits) in chemical engineering fundamentals, to be selected from:
   - CH546 Chemical Reactor Analysis II
   - CH560 Transport Phenomena
   - CH561 Chemical Engineering Analysis

2. CH571 Advanced Chemical Engineering Thermodynamics

3. Two graduate courses (6 credits) in chemical engineering applications, to be selected from a list available from the Department of Chemical and Biomolecular Engineering.

4. One graduate technical elective (3 credits) in engineering, mathematics or science (500 or 600 level in BY, CE, CH, CM, CS, EE, ES, IH, MA, ME, MP, PH, PY, SU).

5. An additional 3 restricted graduates electives (3 credits) in business, engineering, mathematics, science or communication and media.

6. Two credits of CH610 Chemical Engineering Seminar.

7. Four credits of CH611 Master of Engineering Project. A design project carried out under the direction of a chemical engineering faculty member, requiring the completion of a written report.

#### Typical program for student entering with BS in Chemical Engineering

| Fall semester: | One ChE fundamentals course |
|               | 3 credits                   |
|               | One ChE applications course |
|               | 3 credits                   |
|               | One restricted course       |
|               | 3 credits                   |
|               | One technical elective      |
|               | 3 credits                   |

| Winter semester: | One ChE fundamentals course |
|                 | 3 credits                   |
|                 | One ChE applications course |
|                 | 3 credits                   |
|                 | One restricted course       |
|                 | 3 credits                   |
|                 | One technical elective      |
|                 | 3 credits                   |
ChE seminar 1 credit
MEng project 2 credits
Total 15 credits

Spring semester:
One ChE fundamentals course 3 credits
One ChE applications course 3 credits
Two restricted elective 6 credits
ChE seminar 1 credit
MEng project 2 credits
Total 15 credits

Summer:
Complete MEng project 0 credits

Typical program for student entering with BS in Chemistry or Physics

Fall semester:
CH501 Directed Study in ChE Principles 3 credits
One restricted elective* 3 credits
One technical elective 3 credits
ChE Seminar 1 credit
Total 10 credits

Spring semester:
CH502 Directed Study in ChE Principles II 3 credits
One ChE fundamentals course 3 credits
One ChE applications course 3 credits
ChE Seminar 1 credit
MEng project 2 credits
Total 12 credits

Summer:
Work on MEng project 0 credits

Fall semester:
One ChE fundamentals course 3 credits
One ChE applications course 3 credits
One restricted elective* 3 credits
MEng project 2 credits
Total 11 credits

Graduate Courses in Chemical Engineering Applications Acceptable for the Master of Engineering Degree in Chemical Engineering may be found on the Student Administrative Services website in the University Course Catalog.

PHD Degree in Chemical Engineering

Prerequisites
BS (or BE) or MS (or ME) in chemical engineering, materials science, chemistry, or other areas.

Prerequisite courses
Program Length
Five calendar years (60 months) for those with a BS (or BE) or MS (or ME) in chemical engineering, materials science, chemistry, or other areas.

Degree Requirements
The following requirements apply exclusively to chemical engineering PhD students. The student must take the four courses required for the MS degree program or their equivalent.

- CH546 Chemical Reactor Analysis II
- CH560 Transport Phenomena
- CH561 Chemical Engineering Analysis
- CH571 Advanced Chemical Engineering Thermodynamics

1. The student must obtain average GPA 3.0 or better in the required CH courses.
2. Students entering the PhD program should register for a minimum of 10 credit hours each semester until they satisfy the 90 credit hour requirement.
3. The student must take a minimum of 15 credit hours in the major field, a minimum of 9 credit hours in the minor field, and a minimum of 6 credit hours taken from a department other than Chemical Engineering.
4. The student must take a qualifying examination and adhere to the guidelines described in the section “PhD Qualifying Examination and Research Proposal Review.”
5. The student must take the PhD qualifying examination no later than 18 months after completing the MS requirements. Students given direct entry into the PhD program must take the qualifying exam no later than 18 months after being invited into the PhD program. Students entering with a MS degree must take the qualifying exam no later than 18 months from the time when they enter the graduate program. A student who violates the 18 months time limit will not be eligible for tuition support until qualifying examination is passed.
6. Course work (minimum) = 30 credit hours (this is equivalent to 4 three-credit courses beyond MS). David D. Reh School of Business courses cannot be taken to satisfy this requirement.
7. Seminar = 6 credit hours
8. Thesis = 54 credit hours
9. Maximum of 30 credit hours including research credits may be transferred from a Masters degree towards Ph.D. requirements (B grade or better). To transfer credits for the required CH courses, student’s faculty adviser should determine the eligibility for credit transfer. It is recommended that students take at least two of the four required CH courses even if they completed all the courses in their previous institutions.
10. While in residence, all students are required to attend all seminars.

Direct Entry into PhD Program
First year graduate students whose past academic and first semester records at Clarkson indicate outstanding research potential will be invited to enter directly into the PhD program. The thesis required in the regular MS program will be bypassed.
The department will decide which students will be invited into this program at the beginning of the second semester of the student’s residence on campus. The MS degree is awarded to the student upon completion of 40 credit hours and after passing the PhD qualifying examination.

**Financial Assistance**

Financial support for students enrolled in the PhD program is usually in the form of research assistantships, and not teaching assistantships. Continuation of support is based on academic standing and research accomplishments, and may be terminated after written notification by the Graduate Committee for lack of acceptable progress in either area. Support will continue for no more than five years beyond the BS or three years beyond the MS, whichever is longer. Requests for continued support must be made in writing to the Graduate Committee.

**PhD qualifying examination and research proposal review**

Within 18 months following completion of requirements for the Master of Science degree or arrival at Clarkson (whichever is later), the student must complete a “Doctoral Research Proposal” and submit this proposal to the Examining Committee. For students with a BS degree who, because of demonstrated exceptional abilities, are permitted to seek direct entry into the PhD program, the proposal must be completed within 18 months of entry into the PhD program. The student must meet with the Examining Committee as early as possible after being admitted to the PhD program to discuss plans for the Research Proposal. No earlier than one full week subsequent to submission of the Research Proposal, the committee members and the student will meet to conduct a PhD qualifying examination. The student will formally present the contents of the proposal to the committee in the form of a seminar of approximately 30 to 45 minutes duration. The presentation will be followed by an oral defense of the proposed research and related topics.

The purpose of the preliminary meetings, presentation, and the defense is three-fold:
1. To determine whether the student is capable of and qualified for the PhD program.
2. To acquaint the members of the Committee with the subject of the student’s research and to elicit their suggestions on and criticisms of the proposed approach.
3. To insure that adequate progress is being made throughout the 18 month period toward defining a PhD research program.

Each of these items requires the student to have a comprehensive understanding of the PhD project.

A student who violates the 18-month time limit will not be eligible for tuition support until qualifying examination is passed.

The Examining Committee, which will also serve as the student’s Doctoral Committee, will consist of a minimum of five members, including the student’s thesis advisor and at least one faculty member from a department other than Chemical and Biomolecular Engineering. At least three of the committee members must be from Chemical and Biomolecular Engineering. At least four of the committee members must be on the Clarkson faculty. One or more external examiners,
holding the PhD degree, may also serve on the Committee. The thesis advisor will recommend the names of prospective committee members to the Graduate Committee. The Graduate Committee, with the approval of the Graduate School, will appoint the Examining Committee. While the thesis advisor will serve as the Chair of the Doctoral Committee, the advisor will not be the Chair of the Examining Committee. Hence, the advisor should also recommend a Chair to the Graduate Committee. The research proposal itself should represent roughly six months effort in defining a problem, reading pertinent literature, specifying plans for theoretical and/or experimental work and writing the report. At least seven typed copies of the proposal should be prepared, one for each member of the Examining Committee, the Department, and the student. A Master’s Thesis does not constitute a Doctoral Research Proposal, for which a suggested outline in attached. In particular, the proposal should stress the definition, importance and uniqueness of the problem.

The Chair of the Examining Committee will be responsible for conducting the meeting and for reporting to the Graduate Committee the Examining Committee’s recommendation on the entrance of the student into the PhD program. The day following the examination, the Chair will receive from each person on the Committee her/his written vote on the student. The vote will be one of the following:

1. Pass. The student is clearly PhD caliber.
2. Fail. The student is clearly not PhD caliber.

The Chair of the Examining Committee will collect and summarize the vote for the other members of the Committee. The summary will be forwarded by the Chair to the Graduate Committee within two days. The Chair of the Graduate Committee will inform the student, in writing, of the decision of the Examining Committee. The student may retake the exam within one month if the final vote is “Fail”.

If, subsequent to the qualifying examination and during the course of the doctoral research, the student or thesis advisor decides that a significant change in the direction of the research project is warranted, the student’s Doctoral Committee should be so informed. A re-examination of the student will not be involved. In any event, it is recommended that annual meetings be held with the Doctoral Committee to review the student’s progress and to agree on work remaining to be completed.

ChBE Faculty
Professors S.V Babu, Ruth E. Baltus, David Mitlin, Ross Taylor, John McLaughlin, E. Podlaha-Murphy; Associate Professors Sitaraman Krishnan, Richard J. McCluskey, Selma Mededovic Thagard; Assistant Professors Yuncheng Du, Shunsuke Nakao, Eunsu Paek, Zijie Yan

Civil and Environmental Engineering (CEE) Programs
John Dempsey, Chair
jdempsey@clarkson.edu
Graduate education in civil and environmental engineering concentrates in the following specialties:

- Environmental Engineering
- Geotechnical Engineering
- Structural and Materials Engineering
- Water Resources Engineering
- Transportation Engineering
- Construction Engineering Management (ME degree only)

**Requirements for the MS Degree in Civil and Environmental Engineering Program**

**Prerequisites**

BS, BE, or equivalent degree from an accredited program in Civil and Environmental Engineering or other engineering discipline is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted.

No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

**Degree Requirements**

1. The following are minimum requirements:
   - 30 credit hours with all coursework approved at the graduate level
   - 6 credit hours of thesis
   - 18 credit hours of coursework
   - 2 credit hours of seminar work
   - 20 of the 30-credit hour minimum must be earned in residence
   - 1 academic year of full time study beyond the BS
   - Maximum of 10 credit hours transfer credit (grade of B or better)
   - All students must complete a thesis and defend it orally to a committee consisting of a minimum of three faculty members.

In consultation with your advisor, students should consider taking ES 542 (Fundamentals of Research and Graduate Study), when offered by the University.

2. Pass a group of core courses in one of the following professional concentrations comprising a minimum of 15 credit hours:
   - Environmental
   - Geotechnical
   - Structural
   - Water Resources
   - Transportation Engineering.

**Requirements for the Master of Engineering Degree in Civil and Environmental Engineering**
Prerequisites

BS, BE, or equivalent degree from an accredited program in Civil and Environmental Engineering or other engineering discipline is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted. No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Program Degree Requirements
(specialties other than Construction Engineering Management)

The following are minimum requirements:

• 30 credit hours
• 18 credit hours of graduate coursework at least 12 credits of these within engineering
• 1 credit hour of project work
• 2 credit hours of seminar
• 2 semesters in residence
• One-half of the total course credits at graduation must have a CE prefix.

Pass a group of core courses in one of the following professional specialty areas comprising a minimum of 15 credit hours: Environmental, Geotechnical, Structural, Water Resources or Transportation.

Projects must be completed and approved by the student’s advisor and Department Chair by filling out a completion memo. For projects completed at the beginning of a new semester, the final approval of the project and completion forms must be received in the Graduate School no later than the second week of classes (last day to register) or the student must register and pay tuition for one credit hour of thesis.

Requirements for the PhD Degree in Civil and Environmental Engineering

Prerequisites

A MS degree from a program in Civil and Environmental Engineering or other engineering discipline is required for admission. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted. No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Degree Requirements

1. The following are minimum requirements:
   • 90 credit hours beyond the BS
   • 39 credit hours of coursework
   • 15 credit hours in the major field
   • 9 credit hours in the minor field
• 6 credit hours from a department other than the one in which the student is housed (courses double listed in CE and another department do not count in these 6 credit hours)
• Six credit hours of seminar

In consultation with your advisor, students should consider taking ES 542 (Fundamentals of Research and Graduate Study), when offered by the University.

2. A maximum of 30 credit hours transfer credit (grade of B or better).
3. All work to be completed within seven years after the candidacy procedure is completed.
4. Pass a group of core courses in one of the following professional concentrations comprising a minimum of 15 credit hours: Environmental, Geotechnical, Structural, Water Resources, and Transportation Engineering.

Advisory Committee, Preliminary Exam, Research Proposal, and Dissertation Defense
Additional requirements in CEE for PhD students follow.

PhD Advisory Committee:
The Research Advisor recommends the membership of the PhD Advisory Committee to the Department Chair and the Dean of Engineering for their approval. The committee must be appointed prior to the preliminary examination. The Advisory Committee and the Research Advisor will approve the courses required to satisfy the students’ minor. This committee must consist of five members qualified to sit on such a committee, at least one of which must be from outside the candidate’s department. Normally, the Research Advisor will not act as Chair of the committee. The purpose of the committee is to provide guidance to the student for the course work and research.

PhD Comprehensive Examination:
Satisfactory completion of this examination must be done within two years of full-time study after admission to the PhD program. In CEE the PhD Comprehensive Examination consists of two parts: a comprehensive examination and a research proposal defense. The comprehensive examination should be taken within 18 months after entry into the PhD program. It will have a written portion consisting of a one-week take-home exam with access to research materials, and an oral portion to be administered by the Advisory Committee within one month after the conclusion of the written exam. In the event of failure of the written exam, the Advisory Committee may, at its discretion, elect not to administer the oral portion. The outcome of the exam is determined by a vote of the committee, with no more than one dissenting vote permitted for passage. Failure to pass the comprehensive examination twice is grounds for dismissal from the program. The second part of the PhD Comprehensive Examination is the Research Proposal Defense Presentation. Within six months after the successful completion of the comprehensive examination or 24 months from matriculation, the Ph.D. student must submit and orally present and defend a research proposal to the Ph.D. Advisory Committee. This presentation may be administered simultaneously with the oral portion of the comprehensive examination. Upon successful completion of the Engineering PhD Candidacy Exam, the student is admitted to Candidacy for the Ph.D. degree.

Core Courses in Professional Specialties
Professional concentrations require a minimum of 15 credit hours of relevant coursework. The following core courses are required for each of the 5 professional concentrations. Additional relevant courses may be necessary to complete 15 credit hours:

**Environmental Engineering**
Water and Wastewater Engineering: Satisfied by an appropriate course as an undergraduate or:
- CE579 Water and Wastewater Treatment Decision
- CE580 Environmental Chemistry
- CE584 Chemodynamics
- CE582 Environmental Systems or CE586 Industrial Ecology

And one of the following:
- CE681 Environmental Physico-Chemical Processes
- CE682 Environmental Biological Processes
- ES534 Air Pollution Control

**Geotechnical Engineering**
Choose three from the following list:
- CE512/ME555 Introduction to Structural and Soil Dynamics
- CE513 Elastic Waves and Non-Destructive Tests
- CE516 Advanced Soil Mechanics
- CE519 Advanced Foundation Design
- CE527/ME527 Advanced Fluid Mechanics
- CE538 Introduction to the Finite Element Method
- CE551 Theory of Elasticity
- CE554 Continuum Mechanics
- ME531 Computational Fluid Dynamics

**Structural and Materials Engineering**
- CE549 Experimental Methods in Structures
- CE554 Continuum Mechanics

And choose two from the following list:
- CE501 Fracture Mechanics of Concrete Structures
- CE512 Introduction to Structural and Soil Dynamics
- CE520 Computational Methods of Structural Analysis
- CE521 Analysis of Advanced Composite Structures
- CE538 Introduction to Finite Element Method
- CE551 Theory of Elasticity
- CE553 Properties and Performance of Concrete Materials
- CE631 Cement Chemistry
- CE633 Plasticity

**Water Resource Engineering**
Choose four from the following list:
- CE527/ME527 Advanced Fluid Mechanics
CE54 Continuum Mechanics
CE569 Watershed Analysis
CE570 Stream Riparian System and Fluvial Morphology
CE571 Computational River Dynamics
CE572 Shallow Water Hydrodynamics
CE573 Sediment Transport
CE574 Hydrodynamic Dispersion
CE575 Coastal Engineering
CE576 Hydraulic Engineering in Cold Regions
ME531 Computational Fluid Dynamics

Transportation Engineering
Focused areas include:
Intelligent Transportation Systems (ITS)
Transportation systems modeling and simulation
Advanced transportation management
Connected/Automated Vehicles
Cyber-physical transportation systems
Transportation infrastructure monitoring and management
Sustainable and Resilient transportation systems
Transportation Planning
Traffic flow theory
Highway safety
Construction Engineering Management (CEM):

_Erik Backus, Director of CEM_
ebackus@clarkson.edu

The Masters of Engineering (ME) degree in Civil and Environmental Engineering with a specialty track in Construction Engineering Management (CEM) is available for students that have a BS in Civil Engineering or from another engineering discipline. The degree requirements are:

Total of 30 graduate credits hours

1. Three Core CEM Courses (9 credits)
2. Three Civil and Environmental Engineering (CEE) courses taken from an elective list (9 credits)
3. Three Business Management Courses (9 credits)
4. ME Project (3 credits)

The CEM track is designed for flexibility giving students the opportunity to choose courses that meet their needs and schedule. The CEM project advisor will be selected through agreement between the Director of CEM, the student, and project advisor. At the completion of the project work, the student will prepare a formal report and submit it to the project advisor. When the report is approved by the advisor, the project credits will be formally granted. Project credits can be taken in the summer.

Required Core CEM Courses (9 credits)
CE 506 Advanced Construction Engineering (even Fall semesters)
CE 510 Sustainable Infrastructure and Building (all Fall semesters)
CE 591 Special Topics in Construction Engineering Management (all Spring semesters)
CEE Electives (9 credits): three are required, which may include:
CE 512 Intro to Structural and Soil Dynamics (on demand)
CE 513 Elastic Waves and Non-Destructive Testing (even Fall semesters)
CE 515 Foundations, Stability, and Retaining Structures (all Fall semesters)
CE 516 Advanced Soil Mechanics (odd Fall semesters)
CE 519 Advanced Foundation Design (odd Spring semesters)
CE 520 Computational Methods of Structural Analysis (all Spring semesters)
CE 521 Analysis of Advanced Composite Structures (on demand)
CE 538 Introduction to Finite Element Method (all Fall semesters)
CE 549 Experimental Methods in Structures (all Spring semesters)
CE 553 Properties and Performance of Concrete Materials (all Spring semesters)
CE 555 Structural Damage: Assessment, Repair, and Strengthening (odd Spring semesters)
CE 622 Geo-Structural Design (even Spring semesters)
CE 631 Cement Chemistry (even Spring semesters)

Three Business Management Courses (9 credits)
Based on student’s interests and approval of the Director of CEM, three courses are selected from the MBA program in the areas of Economics, Ethics, Supply Chain Management, Accounting, Finance,
Decision Analysis, Information Systems, and Marketing.

Length of Program
Full-time students may complete the degree in one year. Part-time students may complete the ME degree in CEM within three years.

Advanced Certificate in Construction Engineering Management (CEM)
The Certificate Program in Construction Engineering Management (CEM) provides a post undergraduate sequence of courses and subjects that deepen understanding in key construction engineering topics. Using a variety of methods, students engage with professionals, subject matter experts, and practitioners in the field, providing current working knowledge of the state of the industry.

Required Courses Include (nine credits):
- Sustainable Infrastructure and Building CE510
- Special topics in Construction Engineering Management CE591
- Advanced Construction Engineering Part I CE506
- Advanced Construction Engineering Part II CE506

Program Length
Most candidates complete their certificate program in 9 months to 1.5 years.

Faculty
Environmental Faculty
Professors Andrea Ferro, Stefan Grimberg, Thomas Holsen; Associate Professor Shane Rogers

Geotechnical Faculty
Assistant Professors Khiem Tran, Sara Khoshnevisan

Structures Faculty
Professors John Dempsey, Levon Minnetyan; Associate Professors Sulapha Peethaparan, Steven Wojtkiewicz

Water Resources Faculty
Professors Weiming Wu, Poojitha Yapa, Assistant Professors Ian Knack, Tyler Smith

Transportation Faculty
Assistant Professor Behzad Behnia
Electrical and Computer Engineering (ECE) Programs

David Crouse, Chair of Electrical & Computer Engineering
dcrouse@clarkson.edu

The Electrical and Computer Engineering department offers programs of study leading to the degree of Master of Engineering (ME), Master of Science (MS) in Electrical Engineering on the Potsdam campus, an Electrical Engineering Master of Engineering (ME) and Master of Science (MS) through the Capital Region Campus, and the Doctor of Philosophy (PhD) in Electrical and Computer Engineering. Clarkson University also offers an off-campus PhD option designed to assist qualified non-resident candidates to matriculate at Clarkson University as doctoral degree candidates.

Graduate courses cover a range of specialty areas which may be found in the University Course Catalog on the Student Administrative Services website. The specialty areas include: Power, Communications and Signal Processing, Data Communications and Networks, Electronics, Computer Hardware, Computer Software, Biomedical Engineering, and Biometrics

Requirements for Master of Engineering (ME) Degree in Electrical Engineering

Prerequisites
BS, BE, or equivalent degree from an accredited program in Electrical, Computer and Software Engineering or other engineering discipline is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted.

No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Degree Requirements
The following are minimum requirements:

- 30 credit hours
- 21 credit hours of graduate coursework (500-600 level courses)
- A major or portion (more than 50%) of the course work will be in the ECE department
- 1 credit hour of project work
- 2 credit hours of seminar
- 2 semesters in residence
- All work must be completed in 5 calendar years

The student must prepare a written report documenting his/her project work. This report must be approved by the student’s advisor, and submitted to the ECE Department as part of the graduation requirements. The advisor’s approval certifies that the project work has been completed successfully as appropriate for the number of project credits in the student’s program of study.

Requirements for the Master of Science (MS) Degree in Electrical Engineering
Prerequisites
BS, BE, or equivalent degree from an accredited program in Electrical, Computer and Software Engineering or other engineering discipline is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted. No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Degree Requirements
The following are minimum requirements:
- 30 credit hours
- 18 credit hours of graduate coursework (500-600 level courses)
- A major or portion (more than 50%) of the course work will be in the ECE department
- 2 credit hours of seminar work
- Maximum of 10 credit hours transfer credit (grade of B or better)
- A thesis submitted in partial fulfillment of the requirements for the Master of Science degree will be examined by a committee of at least three Clarkson faculty members. All students must defend it orally to the committee.

Requirements for the Master of Science (MS) Degree in Electrical Engineering
(Capital Region Campus)

Prerequisites
A BS in engineering or equivalent. Students applying from other disciplines will be handled on a case by case basis. Those students who are not fully prepared to pursue graduate work in engineering may be required to take additional courses for which graduate credit will not be given. Admission to the MS program will be given only after the required prerequisite coursework has been completed.
Program Objective
One and one-half – Two years (Full-time)
Two and one half – Three years (Part-time)

Degree Requirements
30 credits of course work and MS Graduate Project EE 699 (see below)

The Master of Science in Electrical Engineering Program requires a total of ten courses. Each student’s program should include at least seven Electrical Engineering courses and up to three electives. The elective courses are selected from Engineering (Mechanical or Electrical), Computer Science, School of Business MBA Program, or from the Business of Energy Program. Not all courses from these areas are satisfactory selections; therefore all course selections must be approved by the graduate advisor before course registration. Each student must submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.

An option of replacing two of the ten courses with Research and Thesis courses requires departmental (Associate Dean) approval prior to beginning the program (as these opportunities are limited). Students not completing Research and Thesis courses are required to complete the MS Graduate Project in Electrical Engineering (EE 699). This is a non-credit, no-fee project that serves as the culminating experience of the MS in Electrical Engineering degree.

EE Courses
EE 699 - Master of Science Graduate Project in Electrical Engineering

Power/Energy Conversion (Energy-Related)
EE 642 - Electronic Power Conversion
EE 653 - Modeling and Control of Energy Conversion
EE 682 - Electromechanical Energy Conversion

Power Systems (Energy-Related)
EE 680 - Power System Analysis I
EE 681 - Power System Analysis II

Controls (Energy-Related)
EE 657 - Linear Control Systems
EE 658 - Digital Control Systems

Special Interest
EE 645 - Super Conductivity
EE 644 - Solid State Electronics
EE 606 - Motor Acoustics

Misc.
EE 602 - Engineering Statistics
Energy
EE 687 - Nuclear Engineering
EE 640 - Fuel Cell Science and Hydrogen Engineering
EE 643 - Photovoltaic Engineering
EE 683 - Turbine Engineering
EE 685 - Solar Energy Engineering
EE 684 - Wind Energy Engineering
EE 686 - Synchronous Generator Engineering
EE 600 - Disruptive Technology (As elective only)
EE 601 - Sustainability (As elective only)

Sample Electives
BOE 610, 611, 612, 613, 614, 615
OM 607 - Global Supply Chain Management
OS 603 - Leadership and organizational Behavior
Additional School of Business MBA Core Courses and Electives

Requirements for the PHD Degree in Electrical and Computer Engineering

Prerequisites
A MS or ME degree from a program in Electrical Engineering or other engineering discipline is required for admission. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted.
No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Degree Requirements
1. The following are minimum requirements:
   • 90 credit hours beyond the BS
   • 39 credit hours of coursework
   • 15 credit hours in the major field
   • 9 credit hours in the minor field
   • 6 credit hours from a department other than the one in which the student is housed (courses double listed in ECE and another department do not count in these 6 credit hours)
   • Six credit hours of seminar
   • Two years of residency for on-campus students
2. A maximum of 30 credit hours transfer credit (grade of B or better)A minimum of three academic years of full-time study or the equivalent in part-time study. Students matriculated in the off-campus PhD program are exempt from this residency requirement (see catalog for details of the off-campus PhD program).
3. Comprehensive Examination: All students must pass a comprehensive examination within one
year after entering the PhD program.

The comprehensive examination will provide students with an opportunity to demonstrate depth and breadth of knowledge in their field of specialization covered in any reasonable undergraduate program. The goal is to construct an examination that will not require extensive study time. The scope of the examination will be limited to undergraduate material and thus students should be prepared for it at the start of their graduate program. The graduate committee will be responsible for organizing and administering the comprehensive examination.

**Length of Program**
Satisfactory completion of the PhD candidacy procedure within two years of full-time study after admission to the PhD program or, for part-time students, before completing 66 credits.

- After completion of the candidacy procedure, the student will be identified as a “PhD Candidate.”
- Students who fail the candidacy procedure may make a second attempt according to department guidelines.
- A student who does not successfully complete the candidacy procedure within the time allowed may be dropped from the graduate program.

**ECE Faculty**
Professors, Ming-Cheng Cheng, David Crouse, William Jemison Paul McGrath, Thomas Ormeyer, Stephanie Schuckers, Charles Robinson; Associate Professors James Carroll, Daqing Hou, Abul Khondker, Jack Koplowitz, Lei Wu; Assistant Professors Jie Li, Chen Liu, Mahesh Banavar, Faraz Hussain, Chenchen Liu and Yu Liu.
Mechanical Engineering Programs
Dr. Daniel T. Valentine, Chair
dvalenti@clarkson.edu

Graduate education in Mechanical Engineering focus in the following specialties:
  • Fluid mechanics, multiphase flows and thermal sciences engineering
  • Materials and Fabrication Engineering
  • Energy Systems and Renewable Energy Engineering
  • Mechanical Systems and Design Engineerin
  • Biomechanical and Rehabilitation Engineering

Requirements for the ME Degree in Mechanical Engineering

Prerequisites
BS in engineering or equivalent is required. Students applying from other disciplines will be handled on a case by case basis. Those students who are not fully prepared to pursue graduate work in mechanical engineering may be required to take additional courses for which graduate credit will not be given. Admission to the ME program will be given only after the required prerequisite coursework has been completed.

Degree Requirements
1. The following are minimum requirements:
  • 24 credit hours of graduate coursework
  • 4 credit hour of project work (ME 616)
  • 2 credit hours of seminar
  • The course work must satisfy the following requirements: A minimum of two MAE graduate courses must be taken. Typical courses are:
    ME527 Advanced Fluid Mechanics
    ME537 Fluid Mechanics of Aerosol Dis
    ME529 Stochastic Processes in Engineering
    ME538 Experimental Aerosol Mechanics and Instrumentation
    ME554 Continuum Mechanics
    ME555 Advanced Mechanical Vibrations
    ME595 Principles of Physical Metallurgy
    ME633 Plasticity
    ME639 Advanced Turbulence
  • At least one mathematics course must be taken. Suggested courses are:
    CE556 Engineering Analysis
    CH561 Engineering Analysis
    ME515/MA572 Finite Element Methods
    MA514 Sets and Topology
    MA521 Classical Complex Analysis
    MA522 Classical Real Analysis
    MA531 Initial and Boundary Value Problems
MA550  Nonlinear Partial Differential Equations  
MA577  Numerical Methods  
MA578  Numerical Analysis  
MA581  Probability  

Other courses may also be acceptable with the written approval of the MAE Graduate Committee.  

- At least two graduate engineering courses with focus on practice and design. The following is a list of suggested courses:  
  ME517  Advanced Thermal Systems  
  ME531  Computational Fluid Dynamics  
  ME543  Advanced Optimal Design  
  ME544  Advanced CAD  
  ME557  Advanced Mechanics of Composite Materials  
  ME563  Applied Dynamical Systems  
  ME580  Adv. Mod & Sim of Design System  
  ME590  Advanced Welding Metallurgy  

Other courses may also be acceptable with the written approval of the MAE Graduate Committee.  
No more than two courses may be selected from this group.  
  ME591  Selected Topics in Materials Engineering  
  ME594  Selected Topics in Manufacturing  
  ME618  Selected Topics in Heat Transfer  
  ME628  Special Topics in Fluid Mechanics  
  ME657  Selected Topics in Solid Mechanics  

Only reading or lecture courses are acceptable. Other courses may also be acceptable with the written approval of the MAE Graduate Committee.  

- At least 15 course credit hours must be in engineering.  
- The ME student has the option of continuing towards a PhD degree if accepted into the PhD program by the MAE Graduate Committee.  

Requirements for the MS Degree in Mechanical Engineering  
(Potsdam Campus)  

Prerequisites  
BS in engineering or equivalent. Students applying from other disciplines will be handled on a case by case basis. Those students who are not fully prepared to pursue graduate work in engineering may be required to take additional courses for which graduate credit will not be given. Admission to the MS program will be given only after the required prerequisite coursework has been completed.  

Program Length  
Program Duration: One and one-half year (three semesters and summer)  

Degree Requirements  
1. 18 credits of course work
2. 2 credits of seminar  10 credits of research project work (ME 614 – Thesis/Dissertation) with a MAE faculty advisor. One credit may be ES 542 – Fundamentals of Research and Graduate Study

3. A minimum of two ME graduate courses must be taken. Suggested courses are:
   - ME517 Advanced Thermal Systems
   - ME527 Advanced Fluid Mechanics
   - ME529 Stochastic Processes in Engineering
   - ME531 Computational Fluid Dynamics
   - ME537 Fluid Mechanics of Aerosol Dis
   - ME538 Experimental Aerosol Mechanics and Instrumentation
   - ME543 Advanced Optimal Design
   - ME544 Advanced CAD
   - ME554 Continuum Mechanics
   - ME555 Advanced Mechanical Vibrations
   - ME557 Advanced Mechanics of Composite Materials
   - ME563 Applied Dynamical Systems
   - ME580 Adv. Mod & Sim of Design System
   - ME590 Advanced Welding Metallurgy
   - ME595 Principles of Physical Metallurgy
   - ME633 Plasticity
   - ME639 Advanced Turbulence

At least one mathematics course must be taken. The following is a list of suggested courses:
   - CE556  Engineering Analysis
   - CH561 Engineering Analysis
   - ME515/MA572 Finite Element Methods
   - MA514 Sets and Topology
   - MA521 Classical Complex Analysis
   - MA522 Classical Real Analysis
   - MA531 Initial and Boundary Value Problems
   - MA550 Nonlinear Partial Differential Equations
   - MA577 Numerical Methods
   - MA578 Numerical Analysis
   - MA581 Probability

Other courses may also be acceptable with the written approval of the MAE Graduate Committee.

4. No more than two courses may be selected from this group.
   - ME591 Selected Topics in Materials Engineering
   - ME594 Selected Topics in Manufacturing
   - ME618 Selected Topics in Heat Transfer
   - ME628 Special Topics in Fluid Mechanics
   - ME657 Selected Topics in Solid Mechanics

Other courses may also be acceptable with the written approval of the MAE Graduate Committee.
5. At least 15 course credit hours must be in engineering. No more than two dual numbered courses may be taken for graduate credit.

The MS student has the option of continuing towards a PhD degree if accepted into the PhD program by the MAE Graduate Committee.

Requirements for the Master of Science in Mechanical Engineering (Capital Region Campus)

Prerequisites

The objective of the Mechanical Engineering (ME) Program is to expand graduates’ understanding and applications of solid mechanics, thermal-fluid systems, materials, and manufacturability to advance career opportunities in power systems, emerging energy technologies, and product design evolution. Students are encouraged to consider MBA and Business of Energy courses as electives to integrate business skills and complement technical expertise.

Program Length

One and one-half – Two years (Full-time)
Two and one half – Three years (Part-time)

Degree Requirements

30 credits of course work and MS Graduate Project ME 599 (see below)

The Master of Science in Mechanical Engineering Program requires a total of ten courses. Two of three core courses must be taken by all ME students: ME 502 (Engineering Analysis) is required by all students and one or both of the following: ME 501 (Transport Phenomena) or ME 500 (Elasticity). Of the remaining courses, six must be in the technical Mechanical Engineering major. The remaining courses are selected from Engineering (Mechanical or Electrical), Computer Science, School of Business MBA program, or from the Business of Energy Program. Not all courses from these areas are satisfactory selections; therefore all course selections must be approved by the graduate advisor before course registration. Each student must submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.

An option of replacing two of the ten courses with Master’s Project or Research and Thesis courses requires departmental (Associate Dean) approval prior to beginning the program (as these opportunities are limited). Students not completing Master’s Project or Research and Thesis courses are required to complete an MS Graduate Project in Mechanical Engineering (ME 599). This is a non-credit, no-fee project that serves as the culminating experience of the MS in Mechanical Engineering degree.

ME Courses

ME 599 - Master of Science Graduate Project in Mechanical Engineering
Core
ME 500 - Elasticity
ME 501 - Transport Phenomena
ME 502 - Engineering Analysis

Material
ME 506 - Mechanical Behavior of Materials
ME 508 - Fracture Mechanics
ME 513 - Processing and Selection of Engineering Materials

Structural
ME 509 - Current Approach to Fatigue in Design
ME 516 - Finite Element Methods in Engineering
ME 510 - Advanced Dynamics
ME 512 - Vibrations of Discrete Systems
ME 561 - Engineering Optimization
ME 562 - Composites

Fluids
ME 563 - Dynamics of a Viscous Fluid
ME 564 - Compressible Fluid Flow
ME 565 - Combustion Fundamentals
ME 566 - Fluid Dynamics of Turbo Machinery
ME 573 - Flow and Heat Transfer in Multiphase Systems
ME 572 - Advanced Fluid Dynamics
ME 574 - Computational Fluid Dynamics

Thermal
ME 567 - Thermodynamic Analysis
ME 568 - Thermal Energy Processes (Energy-Related)
ME 569 - Conduction Heat Transfer
ME 570 - Superconductivity (Energy-Related)
ME 571 - Convection Heat Transfer
ME 584 - Principles of Thermal Systems (Energy-Related)

Misc.
ME 560 - Linear Control Systems (Energy Related)
ME 577 - Engineering Statistics
ME 579 - Motor Acoustics
ME 586 - Welding

Energy
ME 575 - Nuclear Engineering and Technology
ME 581 - Fuel Cell Science and Hydrogen Engineering
ME 582 - Photovoltaic Engineering
ME 583 - Turbine Engineering
ME 587 - Solar Energy Engineering
ME 588 - Wind Energy Engineering
ME 589 - Synchronous Generator Engineering
ME 600 - Disruptive Technology (As elective only)
ME 601 - Sustainability (As elective only)

Sample Electives
BOE 610, 611, 612, 613, 614, 615
OM 607 - Global Supply Chain Management
OS 603 - Leadership and organizational Behavior
Additional School of Business MBA Core Courses and Electives

Requirements for the Doctoral Degree in Mechanical Engineering (Potsdam Campus)

Mechanical Engineering Department Requirements (in addition to the University Requirements)
1. A minimum of 39 credit hours of course work.
2. At least two additional ME courses beyond the MS degree course requirements (part of the 39 course credit hours required).

Program Length
For part time students, the 24-month rule is replaced by before 33 credit hours are completed toward the PhD.

Additional Requirements
For a graduate student to continue a minimum of B average is required. A graduate student who obtains more than two C or lower grades (although he/she may have a B average) will be subjected to a MAE Graduate Committee review before the student is allowed to continue. The Graduate Committee will request bi-annual progress reports from the graduate student regarding his/her performance in course work, seminar and research.

Qualifying foreign students with MS degrees from foreign countries will be admitted to the PhD program provisionally. Each of these students are required to take the PhD qualifying examination the first time it is given after his/her tentative admission to the PhD program. If the student does not pass this exam, he/she will automatically be required to pursue a MS degree before being considered again for admission to the PhD program. The Graduate School may grant permission to a graduate student to participate in a Co-op experience. Eligibility for Co-op is limited to those graduate students who have matriculated (i.e., been accepted and enrolled) as a full-time student in residence in one of Clarkson’s graduate degree programs for at least one regular semester and have maintained a GPA of at least 3.0 for all graduate coursework. The graduate students’ request for permission to participate in the Co-op experience must include (1) a written acknowledgement that she or he has discussed the program with a Career Center counselor; (2) documentation that
indicates the Co-op experience is appropriate to the professional and educational objectives of the student, including a statement from the student’s graduate program advisor; and (3) a coursework and project/thesis plan that indicates the student’s intended path to completing degree requirements.

**ME Faculty**

*Professors Goodarz Ahmadi, Daryush Aidun, Cetin Cetinkaya, Suresh Dhaniyala, Brian Helenbrook, John Moosbrugger, Daniel T. Valentine, Kenneth Willmert; Associate Professors Ajit Achuthan, Douglas Bohl, Kevin Fite, Kathleen Issen, , Laurel Kuxhaus, Ronald LaFleur, Marcias Martinez, Pat Piperni, Ken Visser, Steve Yugartis, Philip Yuya, ; Assistant Professors Byron Erath, Ioannis Mastorakos, Parisa Mirbod, Craig Merrett, Arthur Michalek*

**Requirements for the Master of Science in Energy Systems**

*(Capital Region Campus)*

_Hugo Irizarry-Quinones, Associate Dean of Engineering*

**Prerequisites**

A BS in engineering or equivalent. Students applying from other disciplines will be handled on a case by case basis. Those students who are not fully prepared to pursue graduate work in engineering may be required to take additional courses for which graduate credit will not be given. Admission to the MS program will be given only after the required prerequisite coursework has been completed.

**Program Objectives**

The objective of the Master of Science in Energy Systems is to enable students to integrate: (1) Mechanical/Electrical energy related courses, (2) Mechanical and Electrical fundamental discipline courses and (3) non-technical courses regarding the impact of environmental, economic, and regulatory issues on energy. This is a technical degree focused on energy systems and related technology and the impact of our external changing environment on these technologies.

The engineering profession continues to require the understanding and application of technologies that complement each other in their product, system or service applications. Course offerings that include two disciplines (Mechanical/ Electrical Engineering) provide a student with the technical breadth/depth required to compete in the design, commercialization, and service associated with products related to emerging energy systems. Career growth may be additionally enhanced by a broad understanding of non-technical elements impacting change such as sustainability, the disruptive nature of new technology, and the Business of Energy.

The Master of Science in Energy Systems provides a balanced degree program of energy focused mechanical/electrical courses, fundamental discipline mechanical and electrical courses, and the broad understanding of related environment, economic, and regulatory issues.

**Program Length:**

- One and one-half – Two years (Full-time)
- Two and one half – Three years (Part-time)

**Degree Requirements**
33 credits of course work (11 courses)
The Master of Science in Energy Systems requires a total of 11 courses. Each student’s program will include at least five to nine energy related mechanical or electrical engineering courses, two to three non-technical Mechanical or Electrical energy-related and/or Business of Energy courses, and zero to four fundamental technical Mechanical or Electrical engineering courses. Course selection should be approved by the graduate advisor before course registration. Each student should submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.

Courses taken should be selected from the following groupings:

### Energy Systems Courses: Choose 5-9
- **Cross-Listed Courses:**
  - EE 640 / ME 581
  - EE 643 / ME 582
  - EE 657 / ME 560
  - EE 683 / ME 583
  - EE 684 / ME 588
  - EE 685 / ME 587
  - EE 686 / ME 589
  - EE 687 / ME 575
- **EE Courses:**
  - EE 642
  - EE 645
  - EE 653
  - EE 658
  - EE 680
  - EE 681
  - EE 682
- **ME Courses:**
  - ME 568
  - ME 570
  - ME 584

### Non-Technical Energy Systems Courses: Choose 2-3
- **Cross-Listed Courses:**
  - EE 600 / ME 600
  - EE 601 / ME 601
- **BOE Courses:**
  - BOE 610
  - BOE 611
  - BOE 612
  - BOE 613
  - BOE 614
  - BOE 615

### Other Fundamental Technical Courses: Choose 0-4
- **Cross-Listed Courses:**
  - EE 602 / ME 577
  - EE 606 / ME 579
- **EE Courses:**
  - EE 644
- **ME Courses:**
  - ME 500
  - ME 501
  - ME 502
  - ME 506
  - ME 508
  - ME 509
  - ME 510
  - ME 512
  - ME 513
  - ME 516
  - ME 561
  - ME 562
  - ME 563
  - ME 564
  - ME 565
  - ME 566
  - ME 567
  - ME 569
  - ME 571
  - ME 572
Requirements for the Master of Science in Engineering & Management Systems (Capital Region Campus)

Prerequisites
A BS in engineering or equivalent. Students applying from other disciplines will be handled on a case by case basis. Those students who are not fully prepared to pursue graduate work in engineering may be required to take additional courses for which graduate credit will not be given. Admission to the MS program will be given only after the required prerequisite coursework has been completed.

Program Objectives
The objective of the Engineering and Management Systems program is to integrate engineering and computer science technologies with the components of MBA and/or Business of Energy. Students become architects of a multi-disciplined technical/management degree that provides the skills necessary to quickly develop products and move them toward commercialization.

The engineering professions continue to require the understanding and application of broadening technologies that complement each other in their product, system, or service application. Course offerings from all three disciplines (Electrical Engineering, Mechanical Engineering, and Computer Science) may be required to provide a student with their desired technical growth or parallel the direction of their industrial interests. Technical career growth may be additionally enhanced by supplementing strong technical fundamentals with management disciplines such as finance, marketing, operations, or other related business skills related to the energy industry.

The Master of Science in Engineering and Management Systems provides a balanced degree program of Engineering and Computer Science complimented by School of Business MBA Program and/or Business of Energy courses.

Program Length:
One and one-half – Two years (Full-time)
Two and one half – Three years (Part-time)

Degree Requirements
33 credits of course work (11 courses)

The Master of Science in Engineering and Management Systems Program requires a total of eleven courses. Each student’s program will include six technical courses from School of Engineering and/or Computer Science (see below) and five courses from the School of Business MBA and/or Business of Energy programs. Not all courses from these areas are satisfactory selections; therefore all course selections should be approved by the graduate advisor before course registration. Each student should submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.
School of Engineering Courses should be selected from the Mechanical and Electrical technical courses located in the requirements for the Master of Science Degrees in this catalog and/or the Computer Science courses listed below:

CS 500 - Network & Systems Security
CS 501 - Software Quality Management
CS 502 - Business Intelligence
CS 503 - Systems Analysis & Design Methods
CS 504 - Enterprise Architecture
CS 505 - Business Data Communications and Networking
CS 506 - Engineering Statistics

School of Business Courses should be selected from the MBA Core courses and/or electives. Business of Energy courses should be selected from the Business of Energy Program Courses listed in this catalog.

The Master of Science in Engineering and Management Systems Program will not allow graduate work from another institution to be transferred toward completion of this degree program per the existing transfer policy noted elsewhere in this catalog unless specifically approved by the Dean of the School of Engineering.

Requirements for the Graduate Certificate in the Business of Energy
(Capital Region Campus – Online Program)
Hugo Irizarry-Quinones, Associate Dean of Engineering
hirizarr@clarkson.edu

Prerequisites
A minimum of a bachelor’s degree. Applications will be assessed on a case by case basis.

Program Objectives
The Business of Energy graduate certificate program combines contemporary energy issues and related business principles to produce leaders well-versed in the energy marketplace. Students will gain an understanding of power generation, transmission, distribution and the market functions.

Working professionals and recent graduates seeking to advance their careers in professions associated with the energy industry are encouraged to apply. The program is designed for students from all academic backgrounds – including engineering, geosciences, law, business, policy and related disciplines.

Program Duration:
One– Two years (full time or part-time)
**Certificate Requirements**

12 credits of course work (4 courses)

The Online Graduate Certificate in the Business of Energy requires a minimum of four courses. The Fundamentals of the Business of Energy course (BOE 610) core course must be taken by all students. The remaining three courses must be from the five Business of Energy courses.

To get the most out of the program, students are recommended to take all six BOE courses. Students interested in particular courses, but not the complete certificate, may take those courses with the approval of the program advisor.

**Business of Energy Courses**

- BOE 610 Fundamentals of the Business of Energy
- BOE 611 Planning and Operations of Power Systems
- BOE 612 Power Markets
- BOE 613 Deregulations and Restructuring
- BOE 614 Electric Power Industry Economics and Finance
- BOE 615 Challenges to Upgrading Infrastructure

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**Requirements for the Master of Science in The Business of Energy**

**(Capital Region Campus – Online Program)**

**Prerequisites**

A minimum of a bachelor’s degree. Applications will be handled on a case by case basis. Successful applicants will have backgrounds in engineering, business, sciences, law, policy or related disciplines who seek to advance their careers in professions associated with the energy industry.

**Program Objectives**

The objective of the Master of Science in The Business of Energy degree program is to combine contemporary energy issues and related business principles to produce leaders well-versed in the energy marketplace. Students will gain an understanding of power generation, transmission, distribution and the market functions.

The program graduates students with a comprehensive understanding of how business principles apply to power generation, transmission, distribution and consumption. The program blends contemporary energy issues and related business principles to create a focused learning experience designed to increase the student’s competency to generate ideas, solve problems, and manage change and complexity in the challenging energy industry. It is designed for both working professionals and recent graduates, and the courses serve two functions; (1) core program courses provide an understanding of the complexity of the integrated functions within the energy industry from fuel selection/power production to end-user consumption; and (2) business courses strengthen the students’ competency in their professional discipline(s) for application within the energy industry sector.
The program curriculum is delivered entirely online and taught by senior managers with years of experience in the energy business.

**Program Length:**
One and one-half – Two years (Full-time)
Two and one half – Three years (Part-time)

**Degree Requirements**
30 Credits of course work and MS Graduate Project BOE 616 (see below)

The MS-BOE requires a total of ten courses. Each student’s program should include five to six Business of Energy courses and four to five School of Business MBA Program Courses. The BOE 610 (Fundamentals of the Business of Energy) course must be taken by all students. Not all MBA Program courses are satisfactory selections; therefore all course selections must be approved by the graduate advisor before course registration. Each student must submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.

Students are also required to complete an MS Graduate Project in The Business of Energy (BOE 616). This is a non-credit, no-fee project that serves as the culminating experience of the MS in The Business of Energy degree.

**Business of Energy Courses**
BOE 610 - Fundamentals of the Business of Energy
BOE 611 - Planning and Operations of Power Systems
BOE 612 - Power Markets
BOE 613 - Deregulations and Restructuring
BOE 614 - Electric Power Industry Economics and Finance
BOE 615 - Challenges to Upgrading Infrastructure

**Sample Electives**
OM 607 - Global Supply Chain Management
OS 603 - Leadership and organizational Behavior
Additional School of Business MBA Core Courses and Electives
INSTITUTE FOR A SUSTAINABLE ENVIRONMENT
Susan Powers, Director and the Spence Professor in Sustainable Environmental Systems
spowers@clarkson.edu
Alan Rossner, Associate Director
grossner@clarkson.edu

About the Institute
The Clarkson Institute for a Sustainable Environment 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.

Mission Statement
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. The Clarkson Institute for a Sustainable Environment sponsors workshops, seminars, and a small grants program to foster links among its members and facilitate environmental activities. Faculty and students also participate in the Interdisciplinary Programs: BS-Environmental Science & Policy, BS-Environmental Health Science; MS-Environmental Politics & Governance; MS & PhD Environmental Science and Engineering. More information can be found in the Interdisciplinary Program sections of the catalog.

Institute Faculty
The Institute for a Sustainable Environment is comprised of a small group of faculty fully and jointly-appointed in the Institute plus a large number (~70) of affiliated faculty from across the University. The expertise of these faculty spans nearly all fields and disciplines from Engineering, Natural Sciences, Social Sciences, Business, and the Humanities.

MS and PhD in Environmental Science and Engineering
Master's and doctoral degrees in Environmental Science and Engineering (ESE) span multiple disciplines to investigate how science and engineering interact with the environment in a broad context. This approach is necessary since the environment comprises complex, interacting biological, chemical, physical and social systems. It is essential to apply an interdisciplinary framework to understand how these systems function and the many ways environmental factors should be integrated into a comprehensive decision-making process. The unusually broad background of ESE graduates will enable them to better understand how engineering and science impact policy decisions. The research-focused ESE degree programs provide a flexible framework for students to develop coursework and pursue research projects that fit their individual interests.
**MS Prerequisites**
Students are expected to have completed at least one year of calculus, physics, and chemistry, have some background in Fluid Mechanics, and have obtained a BS, BE or equivalent degree from an engineering or science program.

**MS Requirements in addition to University requirements**
Students must take: EV 532 (Risk Analysis), either POL 570 (Environmental Policy) or POL571 (Energy Policy), and either CE 586 (Industrial Ecology) or CE 582 (Environmental Systems Analysis and Design). They must also take at least 3 additional electives (9 credits) following a theme of the student’s choosing subject to approval by the student’s advisor and the chair of the Graduate Committee. At least two of these electives must have an environmental or sustainability focus, as determined by the Graduate Committee. Among these courses, at least three must be designated as Engineering courses. These are either any course offered by the Coulter School of Engineering, or other courses with significant engineering content, as determined by the Graduate Committee.

All students must complete either a Thesis or a Project. Students choosing to complete a Thesis must defend it orally to a Committee consisting of a minimum of three faculty members. Students choosing to complete a project must present their work on campus and have their project and presentation approved by their Advisor and at least one other faculty member affiliated with ISE. Thesis students must complete at least 7 credits of thesis work. Students choosing a Project must complete at least 4 credits towards this project. Projects are expected to be more substantial than a term project, but not necessarily of the depth or breadth such as to be publishable in the academic literature. Projects may be related to a student’s work in a professional context.

**Length of MS Program**
MS Students are expected to complete their degree in 18-24 months.

**PhD Prerequisites**
Students are expected to have completed at least one year of calculus, physics, and chemistry. Most students enter the PhD program following completion of an MS degree. Exceptional students may be invited to proceed directly to the PhD.; such students will be awarded the MS upon completing 40 credit hours and passing the doctoral qualifying examination with a superior grade.

**PhD Requirements in addition to University requirements**
Students must take: EV 532 (Risk Analysis), either POL 570 (Environmental Policy) or POL571 (Energy Policy), and either CE 586 (Industrial Ecology) or CE 582 (Environmental Systems Analysis and Design). Students completing a Masters Thesis must also take at least 3 additional electives (9 credits) following a theme of the student’s choosing subject to approval by the student’s advisor and the chair of the Graduate Committee; students completing a project instead of a thesis must take 4 additional elective classes (12 credits) following a theme. At least two of these electives must have an environmental or sustainability focus, as determined by the Graduate Committee. Among these courses, at least three must be designated as Engineering courses. These are either any course offered by the Coulter School of Engineering, or other courses with significant engineering content, as determined by the Graduate Committee.
All students must complete either a Thesis or a Project. Students choosing to complete a Thesis must defend it orally to a Committee consisting of a minimum of three faculty members. Students choosing to complete a project must present their work on campus and have their project and presentation approved by their Advisor and at least one other faculty member affiliated with ISE. Thesis students must complete at least 7 credits of thesis work. Students choosing a Project must complete at least 4 credits towards this project. Projects are expected to be more substantial than a term project, but not necessarily of the depth or breadth such as to be publishable in the academic literature. Projects may be related to a student’s work in a professional context.

**Length of PhD Program**
PhD Students are expected to complete their degree in 3-5 years.

**Faculty Affiliates**
*Professors Susan Powers, Alan Rossner, Thomas Holsen, Andrea Ferro, Michelle Crimi, Tom Langen; Stefan Grimberg, Michelle Crimi, Michael Twiss, Weiming Wu; Associate Professors Stephen Bird, Martin Heintzelman, Shane Rogers, Selma Mededovic; Assistant Professors: Tyler Smith, Ian Knack, Shunsuke Nakao*

**MS in Environmental Politics and Governance**
The interdisciplinary MS Degree in Environmental Politics and Governance (EPG) provides a unique graduate experience in the policy aspects of environmental management. Graduates are prepared to be the next generation of environmental and energy policy analysts and experts who understand the complex socioeconomic and political processes that inform environmental outcomes — including the allocation of federal funding of environmentally-related research and the development of science-based environmental policy while taking into account the actions and interests of private sector firms and non-governmental organizations in the environmental arena.

**Prerequisites**
Students are expected to have taken a course on American Politics or American Society (sociology) as well as an introductory course in environmental science and have obtained a BS, BE or equivalent degree from an accredited institution.

**Requirements in addition to University requirements**
All students must take: POL 570 (Environmental Policy) or POL 571 (Energy Policy), EC 660 Environmental Economics and one of SS 580 (Research Methods) or EC 611 (Econometrics) or EV 612 Directed Study (Methods), under the direction of the advisor. In addition, students must take at least two different elective courses. These must be from two separate course categories from amongst: Environment & Society, Environmental Philosophy & Theory, Environmental Policy, and Environmental Science. Courses meetings these requirements are listed in the ISE Graduate Handbook. All students must complete a Thesis. Students must defend their thesis orally to a
Committee consisting of a minimum of three faculty members, and must complete at least 7 credits of thesis work.

**Length of Program**
Students are expected to complete their degree in 12-18 months.

**Faculty Affiliates**
*Professors Susan Powers, William Vitek; Associate Professor Martin Heintzelman, Stephen Bird, Christopher Robinson*
INSTITUTE FOR STEM EDUCATION AND DEPARTMENT OF EDUCATION

Peter R. Turner, Director, pturner@clarkson.edu
Catherine L. Snyder, Associate Director csnyder@clarkson.edu
Kathleen R. Kavanagh, Associate Director kkavanag@clarkson.edu
Cindy L. Smith, Operations Manager csmith@clarkson.edu

The Institute for STEM Education changes the way the world does Science, Technology, Engineering, and Mathematics (STEM) education and views teaching and learning, combining disciplinary rigor with pedagogical science in outreach, teacher training, and graduate student and faculty professional development. Programs include the Master of Arts in Teaching (MAT), advanced certificate programs in teaching, as well as industry-leading institutes for higher education pedagogy training.

Masters of Arts in Teaching (MAT)

Catherine Snyder, Chair
ggraduate@clarkson.edu, 518-631-9870

The MAT degree is a licensure endorsing program that prepares candidates for New York State certification at the secondary level (7-12 grade) in the following disciplines: biology, chemistry, earth science, physics, technology (K-12), mathematics, English, social studies, Chinese, French, German, Greek, Latin, Spanish, and Teaching English to Speakers of Other Languages.

The Department of Education also offers programs for New York State teachers who are already initially certified:

- 5th and 6th Grade Extension: two courses that extend teachers’ certifications to 5th and 6th grade in the case of the science, math, social studies, and English.
- Grades 1-6 Foreign Language in the Elementary School (FLES) Extension: A one course program that extends an already New York State certified foreign language teachers certification to 1st grade. Certificate of Advanced Study in Teaching English to Speakers of Other Languages (TESOL): six courses that allow teachers who are already New York State certified a K-12 grade TESOL certification. Some pre-requisites apply including 12 credits of study in a language other than English.

With a 25-year history of success, the MAT program offers prospective teacher candidates all the tools they need to be successful secondary classroom teachers. The Clarkson Master of Arts in Teaching program is the right career choice because:

- Our graduates have a 95% success rate on the rigorous New York State Teacher Certification Exams.
- Every student is placed into an individualized full-year teaching residency in a school that matches his or her career goals.
- Every member of the Clarkson University Master of Arts in Teaching faculty has substantial K-12 teaching experience.

Most of the students who join the Master of Arts in Teaching program arrive with a bachelor’s degree in the discipline they want to teach. No prior education or pedagogy coursework is necessary.

MAT Accreditation
The Master of Arts in Teaching program is accredited by the Middle States Commission on Higher Education, the Teacher Education Accreditation Council, and the New York State Department of Education.

**Prerequisites for the MAT Program**
Clarkson undergraduates interested in pursuing an MAT degree will want to consider the Pre-Teaching Program. The Pre-Teaching Program is a *special advising option* rather than a major. The Pre-Teaching advisor will provide students with guidance in selecting coursework within the candidate’s discipline that meets New York State certification requirements, so that undergraduate courses will count towards both the undergraduate degree and the master’s degree. The Pre-Teaching advisor will help students define career goals, and find opportunities to observe and participate in secondary teaching, so that candidates enter the MAT with strong knowledge of what secondary teachers do. For information on the Pre-Teaching Program, contact Professor Kavanagh at kkavanag@clarkson.edu.

The MAT program requires all candidates to have completed the following prior enrolling:

1. Undergraduate liberal arts core including courses in humanities/arts, writing/communication, social sciences, STEM and 1 semester of foreign language
2. ED 500 - Field Experience – Four days of structured observations in secondary schools. Can be arranged by CRC Department of Education Coordinator. Please call 518-631-9870 (Must be completed prior to the summer intensive program for one year candidates; can be completed in fall or spring in year one if student selects the 2 year program. Waived for students who are already initially certified in NY.)
3. Educational Psychology (an undergraduate course, or independent study with Clarkson’s CRC Department of Education exam. (Must be completed prior to the summer intensive program for one year candidates; can be completed in fall or spring in year one if student selects the 2 year program. Waived for students who are already initially certified in NY.) Available to Clarkson undergraduates as PY 246. Finally, candidates must have at least 24 credit hours of undergraduate study in their major with a GPA of 3.0 or higher at the completion of their undergraduate degree studies. The Pre-Teaching advisor can assist candidates with the selection of appropriate coursework.

**Program Curriculum**
Qualified Clarkson undergraduates are automatically accepted into the MAT program and awarded a two course scholarship. MAT candidates complete the following coursework as part of their 38 credit master’s degree:

**Master of Arts in Teaching in Secondary Disciplines Degree Requirements:**
**(9 courses/29 credits): All students complete the required core.**
ED 540 The Psychology of Teaching with lab component (3 credits)
ED 541 Essential Reading Literacy (3 credits)
ED 511-16 Curriculum and Methods of Teaching (the discipline in which the student will become certified) (3 credits)
ED 502 - NY State Teacher Requirements (1 credit)
ED 503 - Professionalism in Teaching (1 credits)
ED 501 - Teaching Practicum (1 credit)
ED 550 - Effective Teaching for All Learners (3 Credits)
ED 551 - Teaching Residency (4 credits)
ED 560 - The Modern Teacher (3 credits)
ED 552 - Teaching Residency (4 credits)
ED 544 - Literacy for the Content Classroom (3 credits)

Research Project
All students complete an independent research project in their certification area
ED 580 MAT Project (Prefix will listed by discipline ex. HST 580 for MAT Project in History.) (3 credits)

Subject Area Courses
Students complete two electives in the subject area in which they will be obtaining certification. (6 credits)

Master of Arts in Teaching English to Speakers of Other Languages Degree Requirements:
(13 courses/39 credits):
TE 540 - Foundations of Teaching ESOL (3 credits)
TE 530 - English Grammar for the ENL Teacher (3 credits)
ED 517 - Teaching and Assessment Methods for TESOL (3 credits)
ED 513 Curriculum and Methods of Teaching ESOL (3 credits)
ED 502 - NY State Teacher Requirements (1 credit)
ED 501 - Teaching Practicum (1 credit)
TE 531 - English Linguistics (3 credits)
ED 550 - Effective Teaching for All Learners (3 Credits)
TE 551 - Teaching Residency (5 credits)
ED 560 - The Modern Teacher (3 credits)
TE 552 - Teaching Residency (5 credits)
ED 542 – TESOL Literacy (3 credits)
TE 580 – MAT Project (independent research project in TESOL) (3 credits)

Length of Program
Most candidates complete the MAT program in one year (12 months) starting with an intensive summer program, followed by a full-time fall and spring term. Candidates may choose a longer timeline ranging from one and a half years to three years.
Pre-Teaching Program

Students pursuing the pre-teaching track would complete the following course of study:

- Foreign language elective (3 credits)
- PY 246 Educational Psychology (3 credits)
- COMM 217 Introduction to Public Speaking (3 credits)
- STEM 330/STEM 530 Analyzing Science and Mathematical Theories from Philosophical and Historical Perspectives (for STEM majors) (3 credits)
  OR
  HST 388/ HST 588 East Asia Studies (for History majors) (3 credits)
  OR
  MA 453/MA553 Introduction to Mathematical Teaching (for Math majors) (3 credits)
- ED 360/ED560 Modern Teacher (3 Credits)
- Educational Field Experience (1 credits)
- Independent Study: Student would observe 25 hours in secondary classrooms and complete a paper

Faculty

Catherine Snyder, Chair; Sherri Duan, Director of the MAT in Chinese Language; Karen Gregory, Director of TESOL programs; Joseph Skufca, Professor; Seema Rivera, Assistant Professor; Instructors: Patricia Rand, Stephanie Conklin, Dan Mattoon, Bryan Mattice, Peter Melito, David Besozzi, Thomas Shiland, Becky Remis, Rachel Stead, Tracy Pontin, Sean O’Connell, Richard Lasselle, Leigh Feguer, Matthew Raso, Michael Mosall, Jessica Murray, Cesaera Pirrone, Lisa Saccocio, Robyn Salvin.
PROGRAMS IN HEALTH PROFESSIONS

The School of Arts and Sciences offers three entry-level health professions graduate degrees: Doctor of Physical Therapy (DPT), Master of Science in Physician Assistant Studies (MS-PAS), and Masters of Science in Occupational Therapy (MS-OT). The three programs are designed to prepare students to become highly skilled, entry-level healthcare providers who take a patient centered approach and value interdisciplinary care and evidence based practice. Students and faculty of the programs contribute to the knowledge of their profession through inter professional scholarship and practice. All three programs are located in the newly renovated Clarkson Hall with state of the art facilities and equipment designed to provide a supportive and innovative learning environment.

Master of Science in Occupational Therapy (MS)

Victoria Priganc, Chair and Associate Professor
ot@clarkson.edu

The Occupational Therapy Department at Clarkson University in Potsdam, N.Y., serves the health needs of the community through preparation of occupational therapy graduates who engineer solutions that enable health and wellbeing throughout an individual’s lifespan. We believe in the right for all individuals to live their lives with dignity regardless of any disability or barriers to living life to the fullest.

Our graduates will use occupations as both interventions and outcomes to promote an individual’s adaptation to biological, psychological and contextual factors that have interrupted the ability to engage in occupations that have meaning and purpose in the individual’s life.

Our program is designed to change the world through occupational therapy. We develop professionals with deep cultural sensitivity toward the unique needs of rural and underserved populations living with disability. Our graduates will have advanced interprofessional competencies in areas of technology, innovation and education.

Our Occupational Therapy Program is committed to graduating therapists who are prepared to respond to both current and emerging societal needs that influence individual’s occupations. We integrate experiential learning to help students develop internalized working models for activating occupational therapy in traditional and innovative practice settings.

The Occupational Therapy Program at Clarkson is committed to expanding the knowledge of the profession through interprofessional scholarship and practice.

Our curricular goals for our program

Goal 1: Students will be able to design and deliver humanistic, ethical and high quality, individualized occupational therapy services to individual clients and their family/caregivers in both individual and group treatment.

Goal 2: Students will understand and be able to respond with occupation based programs to contemporary and global issues affecting a health, wellbeing and disability, with specific focus on unmet and emerging needs in rural and underserved populations.

Goal 3: Students will be able to integrate innovative, technological, imaginative art and educational resources into program planning, design, management and intervention.
Goal 4: Students will demonstrate the ability to reflect on science and technology, including their relationship to society, their impact on the environment and occupation, and demonstrate the capacity and commitment to grow as an individual and as a professional.

Goal 5: Students will collaborate skillfully with clients, interprofessional team members, and non-professional colleagues, families, and community members and demonstrate the important contribution of OT by doing good work.

Curricular Threads
Clarkson's Occupational Therapy Program's "curricular threads" represent the themes that are interwoven throughout all of the coursework. They reflect the values and priorities of our program, as well as the unique philosophy and mission of Clarkson University.

Professional Identity
Students will value and assume an identity of service and contribution, by promoting occupation and participation in multiple contexts through the identification of barriers to and providing supports for occupational roles and performance patterns.

Innovation
Students will develop the ability to meet the needs of local, regional, and global society, including a focus on rural communities, through research and scholarship.

Technology
Students will learn to engineer solutions through technology including telehealth, assistive technology, and virtual contexts.

Education & Research
Students will develop problem-solving abilities through science-driven practice and the use of practice-based evidence, with a focus on occupation as both intervention and outcome.

Interprofessional Practice
Students will exhibit strong leadership and collaborative skills as they assume roles of advocacy and activism for both clients and the profession.

Master of Science in Occupational Therapy (MS) Admission Requirements
- Complete a baccalaureate degree with a cumulative GPA of 3.0 or higher.
- Take the necessary pre-requisite courses. The overall grade-point average in all pre-requisite courses should be a minimum of 3.2 with no grade lower than a C. See list below for pre-requisite courses.
- Submit documentation of a minimum of 40 hours of observation/volunteer or work experience under the supervision of an occupational therapist or occupational therapy assistant.
- Submit three letters of recommendation. At least one must be from a faculty member who can speak to your academic or professional character and at least one letter must be from an occupational therapy professional. Letters from family, friends or clergy will not be accepted.
• Submit Clarkson’s supplemental application (includes the submission of your 3D skill/craft)
• Satisfactorily complete admissions process.

## Pre-requisites for the MSOT Program at Clarkson University

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Psychology - General Psychology</td>
<td>3</td>
<td>Human Anatomy - Human Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>Abnormal Psychology</td>
<td>3</td>
<td>Human Physiology</td>
<td>3</td>
</tr>
<tr>
<td>Development Psychology</td>
<td>3</td>
<td>English Composition/Critical Thinking</td>
<td>6</td>
</tr>
<tr>
<td>Statistics</td>
<td>3</td>
<td>3D skill / craft**</td>
<td>3 credits or portfolio</td>
</tr>
<tr>
<td>Biology (in addition to A&amp;P)</td>
<td>3</td>
<td>Social Sciences (Anthropology, Humanities, Philosophy, Sociology)</td>
<td>6</td>
</tr>
<tr>
<td>Physics or Kinesiology</td>
<td>3</td>
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</table>

**Recommended but not required**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Communication/Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Scientific Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

**Course must include actual hands-on manipulation of media/materials. Examples: Knitting, 3-dimensional science or engineering project, woodwork, sculpting, loom work, fly-tying, boat making, electric car construction, ceramics, sewing, beading, game design, et al (Portfolio will be reviewed by Graduate Admissions Coordinator to determine if fulfills this pre-req)**

### Application

Applications are made via the Centralized Application Service for Occupational Therapy (OTCAS) [https://portal.otcas.org](https://portal.otcas.org). A supplemental Clarkson University OT program application will be required for qualified OTCAS applicants. A rolling acceptance policy is being used. The class size will be approximately 30 students.

### Supplemental Application

The supplemental application is in addition to the OTCAS application. After verification of the OTCAS application, the program will review and invite qualified applicants to complete a supplemental application. Supplemental applications received that have not been requested by the program will be disregarded and will not be considered for admission to the program. The supplemental application is to be completed only at the request of the program.

For the supplemental application to be completed, it will include:

- Application
- Signed statement of Meeting Technical Standards
- Official transcripts for grades not verified in OTCAS
- Reference letters – a total of three letters are required. If OTCAS has three letters and one is from an Occupational Therapist, no letter is required with the supplemental application.
• One must be from an Occupational Therapist or OTA that has supervised you in a clinical setting.
• One must be from a faculty member who can speak to your academic or professional character is preferred.
• One may be from a professional or academic source.
• 3D skill/craft requirement. 3 dimensional skill/craft must include actual hands-on manipulation of media/materials. Options to meet this requirement include a college/university course or submission of a portfolio.
• $50.00 application fee (check or money order made payable to Clarkson University)

All materials are to be mailed directly to Clarkson University at:
Clarkson University
Department of Occupational Therapy
Attention: Admissions
Box 5883, 8 Clarkson Avenue
Potsdam, NY 13699-5883

For questions about completing the Clarkson University supplemental application, contact the Clarkson University Department of Occupational Therapy at otadmission@clarkson.edu or 315-268-4476 or 315-268-7739.

Program Curriculum
Clarkson's Occupational Therapy Program taps the University's core strengths in engineering, science, entrepreneurship and the arts to provide students with an expansive knowledge base. This specialized Master of Science in Occupational Therapy helps our students embrace the field's essential points:
Engaging in meaningful occupation and finding purpose are profound curatives. A thorough knowledge of human anatomy and psychology — tied to an appreciation for creativity — lead to recovery and unique paths of productivity. Neither disabilities nor perceived differences can violate an individual's dignity or self-determination.

Specialty Tracks
Students will have the opportunity to pursue one of three Clarkson OT Specialty Tracks of study, which will allow them to become immersed in advanced study in their area of interest.
• Technology for Health-Related Quality of Life Track: Students will become clinicians who can design and implement new products utilizing cutting edge technology to assist with client participation in desired activities.
• Occupational Therapist as a Researcher Track: Students will become clinicians who can design and implement research studies that enhance the profession.
• Innovative Practitioner Track: Students will become clinicians who can use innovative principles and inter professional collaboration to design new products, new programs, or a new way of delivering occupational therapy services.

Fieldwork at Clarkson University, experiential learning plays a fundamental role in helping students make connections between the classroom and real-life practice. Initially, this begins informally through service-based learning projects, volunteerism and class assignments. As
students enter the second year of the program, they complete several required fieldwork placements that provide them with strategic learning opportunities to prepare them for transitioning from the role of student to that of occupational therapist.

Our students will have the opportunity to complete two Level I Fieldwork placements while completing the didactic portion of the curriculum. Level I Fieldwork is intended to provide exposure to different populations and settings, to further develop professional behaviors, and to build the comfort and confidence that will be essential to success in Level II Fieldwork. Level I assignments may be with an occupational therapist or with other related professionals. Upon completing all other coursework, students will be required to complete two 12-week Level II Fieldwork placements, which reflect Clarkson’s commitment to innovation. Students will have the opportunity to immerse themselves in OT practice in both traditional settings, as well as those where OT is new or emerging. Students’ unique interests, skills and areas of specialty are taken into account when assigning Level II placements to ensure a good fit.

<table>
<thead>
<tr>
<th>Term I</th>
<th>Course #</th>
<th>Course Name</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>OT 500</td>
<td>Basic Science: Gross Anatomy</td>
<td>4</td>
<td></td>
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<tr>
<td>OT 510</td>
<td>Basic Science: Development and Occupational Performance across the Lifespan</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>OT 520</td>
<td>Basic Science: Mental Health and Occupational Performance</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>OT 530</td>
<td>Foundations in Occupation Based Practice</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>OT 540</td>
<td>Foundations in Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>OT 550</td>
<td>Foundations in Defining and Understanding Occupational Performance</td>
<td>3</td>
<td></td>
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<tr>
<td>OT 590</td>
<td>Professional Seminar A: Professionalism in Occupational Therapy</td>
<td>2</td>
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<td>19</td>
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<table>
<thead>
<tr>
<th>Term II</th>
<th>Course #</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>OT 503</td>
<td>Basic Science: Neuroscience</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>OT 513</td>
<td>Basic Science: Applied Kinesiology for OT’s</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>OT 523</td>
<td>Basic Science: Cognition and Occupational Performance</td>
<td>2</td>
<td></td>
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<tr>
<td>OT 563</td>
<td>Bridging Science to Adult Conditions and Assessments</td>
<td>2</td>
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<tr>
<td>OT 583</td>
<td>Experiential Learning Lab I: Adult Assessment and Intervention Lab</td>
<td>3</td>
<td></td>
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<tr>
<td>OT 603</td>
<td>Engineering Health Through Creativity, Craft and Analysis of Occupation</td>
<td>3</td>
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<td><strong>Total</strong></td>
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<p>| Term III |</p>
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<tbody>
<tr>
<td>OT 605</td>
<td>Engineering Pathway to Participation through Technology</td>
<td>2</td>
</tr>
<tr>
<td>OT 595</td>
<td>Professional Seminar B: Interprofessional Practice and Emerging Practice</td>
<td>2</td>
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<tr>
<td>OT 630, 631, 632</td>
<td>Engineering Your Pathway through Scholarship I</td>
<td>2</td>
</tr>
<tr>
<td>OT 700</td>
<td>Fieldwork Experience</td>
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<td><strong>Total</strong></td>
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**Term IV**

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<th>Course Name</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OT 547</td>
<td>Bridging Science to Pediatric Assessment</td>
<td>2</td>
</tr>
<tr>
<td>OT 557</td>
<td>Bridging Science to Upper Extremity Rehabilitation</td>
<td>2</td>
</tr>
<tr>
<td>OT 567</td>
<td>Bridging Science to Adult Neuro Conditions and Assessment</td>
<td>2</td>
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<tr>
<td>OT 587</td>
<td>Experiential Learning Lab II: Adult Neuro Assessment and Intervention Lab</td>
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<tr>
<td>OT 597</td>
<td>Professional Seminar C: Specialty seminars in OT</td>
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<tr>
<td>OT 640, 641, 642</td>
<td>Engineering Your Pathway through Scholarship II</td>
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<tr>
<td>OT 700a</td>
<td>Fieldwork Experience</td>
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**Term V**

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<tbody>
<tr>
<td>OT 539</td>
<td>Professional Practice, Leadership, Management &amp; Activism</td>
<td>3</td>
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<tr>
<td>OT 549</td>
<td>Synthesizing Evidence and Practice to Become an Evidence Based Practitioner</td>
<td>3</td>
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<tr>
<td>OT 579</td>
<td>Experiential Learning Lab III: Group Dynamics across Practice Settings</td>
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<tr>
<td>OT 589</td>
<td>Experiential Learning Lab IV: Pediatric Intervention Lab</td>
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<tr>
<td>OT 599</td>
<td>Professional Seminar D: Innovation and Advanced Cases</td>
<td>2</td>
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<tr>
<td>OT 650, 651, 652</td>
<td>Engineering Your Pathway through Scholarship III</td>
<td>2</td>
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Term VI

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<tbody>
<tr>
<td>OT 705</td>
<td>Fieldwork Level IIA</td>
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Term VII

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<th>Course Name</th>
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<tbody>
<tr>
<td>OT 710</td>
<td>Fieldwork Level IIB</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
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</tr>
</tbody>
</table>

**Total Program Credits**  **92**

**Length of Program**
The Clarkson Occupational Therapy Program is a 27 month program

**Program Sequence**
Students are expected to complete the designated professional curriculum in the sequence specified. Each semester’s course work is to be considered pre-requisite to the next semester. In order to be eligible to take a course, a student must pass all courses in the previous semester. There is no opportunity to change the order of the courses or the order of the fieldwork. Students are expected to complete each semester on time as a cohort. Student progression will be a function of successfully passing all required courses in a semester.

**Graduation Requirements**
To graduate from the OT Program, and earn the Master of Science in Occupational Therapy degree (MSOT) candidates must:
- Achieve a grade of C or better for all courses in the program
- Achieve a minimum overall GPA of 3.00 or better at program completion
- Successful completion of both levels of fieldwork
- Be recommended for graduation by the Program Chair and Clarkson University Faculty
- Student must have paid all debts to the school and be in good standing

**Clarkson Pre-OT Plan**
Clarkson University offers a Pre-Occupational Therapy program to highly qualified and motivated incoming high school students who wish to pursue a career in occupational therapy. Students accepted into the Pre-Occupational Therapy program will be invited to participate in activities in the OT department and will be granted preferential consideration for the Master of Science in Occupational Therapy program as long as they demonstrate successful completion of the milestones and MSOT pre-requisites, see chart above.
Applicants will signify on their CU application for admission a request to be accepted into the Pre-OT plan. The records/transcripts of those applicants will be forwarded to the OT department for review. The Health Professions Graduate Admissions Coordinator will review the high school records and application and return an acceptance decision to Admissions. Those that matriculate at Clarkson and meet all requirements of this opportunity and formally apply will be granted preferential consideration during the admissions process. Successful applicants will be granted a seat in the next cohort of the Master of Science in Occupational Therapy class following their May graduation from Clarkson University. Those students that accelerate their graduation to December will be considered on a case-by-case basis for the cohort beginning the following Fall semester. Ten seats will be reserved for Clarkson University graduates in each incoming class. Being a Pre-OT student provides a significant advantage in gaining acceptance into Clarkson’s OT program.

Requirements and milestones to be reached:

- Complete the application and essay (state your interest in the field of Occupational Therapy) for entry into the Pre-OT plan
- At all times remain in good standing with Clarkson University. This includes disciplinary action and legal action on or off campus.
- The student must have a cumulative GPA of 3.2 or higher at the end of each semester in all prerequisite courses, while maintaining an overall cumulative grade-point average greater than or equal to 3.0.
- In the first 2 years as a CU undergraduate, candidates will show satisfactory progress in completing OT prerequisite courses. A minimum of 3 prerequisite courses must be completed by that time. Grades on prerequisite courses shall be C or above.
- The candidate will begin or continue gaining experience related to occupational therapy.
- Meet at least once per academic year with the Health Professions Graduate Admissions Coordinator to gauge progress. The Coordinator will review the candidate’s transcripts, review progress experience, and assess the candidate’s aptitude and attitude as a potential OT. Candidates may be released from the Plan at any time if requirements have not been met.

After completion of their second year as a CU undergraduate, candidates will present themselves to the OT faculty for review of their progress. Those who have reached the milestones will continue in the program, then, they must:

- Continue progress and complete all prerequisite courses with a grade of C or better.
- Complete a minimum of 40 required hours of experience by the time of application.
- Graduate in good standing from Clarkson University.
- Formally apply to the Clarkson University OT program via the Occupational Therapy Centralized Application Service (OTCAS) at the appropriate time while meeting all deadlines and requirements of the application. A verified application must be ready for review by September 20th of their senior year. (Note that it takes approximately 4-6 weeks for OTCAS to verify applications.)
- Three letters of recommendation (letters from a faculty member and an OT professional are required)
- Successfully move through the admissions process.
- Ten seats are reserved in each class for CU graduates. CU graduates not selected for the reserved seats will remain in the applicant pool for any remaining seats in the cohort.
Clarkson undergraduates that are not part of the Pre-OT Plan are also welcome to apply via OTCAS at the appropriate time with the applicant pool for that cohort. These requirements are in addition to the major that the student has declared. OT advising is not intended to replace advising by faculty in the student’s declared major.

**Accreditation**

The Clarkson University Master of Occupational Therapy program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association. ACOTE awarded the program a 7-year, full accreditation in August 2017. The next evaluation will be in 2021–2022. ACOTE is located at 4720 Montgomery Lane, Suite 200, Bethesda, MD 20814-3449. ACOTE's telephone number is 301-652-6611 x2914, email is accred@aota.org and its website is www.acoteonline.org.

Clarkson University is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market St., Philadelphia, PA 19104-2680, 215-662-5606. In addition, the University is accredited by the United States Civil Service Commission, and its curricula are approved by the New York State Board of Regents. The Occupational Therapy Program has been registered by the New York State Education Department.

Graduates of the program will be eligible to sit for the National Certification Examination for the Occupational Therapist, administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the graduate will be an occupational therapist, registered (OTR). Graduation from an accredited program is a requirement of NBCOT for certification. It is also required for most states for licensing. For more information on the requirements for certification, see the NBCOT website at http://www.nbcot.org/. For more information on license requirements for New York State, see the New York State Education Department, Office of the Professions website at http://www.op.nysed.gov/prof/ot/.

A felony conviction may affect a graduate’s ability to sit for the NBCOT Certification Examination or attain state licensure.

**Faculty in Occupational Therapy**

*Associate Professor Victoria Priganc; Assistant Professors Brittany DiSalvo, Cindy Hammecker-McLean, Alisha Ohl, David Schelly, Lisa Tebo; Clinical Adjunct Instructor Ashleigh Graveline.*
Mission and Goals
The mission of the Clarkson University Department of Physician Assistant Studies is to educate Physician Assistants to become highly skilled and compassionate health care providers. The program will encourage an interdisciplinary approach with an emphasis on patient-centered care. Graduates will become leaders in the health care community, continuously striving for excellence in their professional endeavors while compassionately providing for the health care needs of those they serve.

The goals of the Department of Physician Assistant Studies are to:
1. Identify for admission those individuals with the academic ability, clinical experience, interpersonal skills, and maturity necessary to become outstanding Physician Assistants.
2. Provide a coordinated, comprehensive didactic and clinical curriculum that will allow graduates to deliver the highest quality of health care services.
3. Promote a didactic and clinical educational environment that embraces the concepts of continuous communication, cooperation, and compassion.
4. Promote an atmosphere of "learner-centered" education that empowers students to become self-directed learners.
5. Instill in students the core values of Clarkson University and the importance of staying in the Clarkson region to practice after graduation.
6. Provide students with the medical knowledge, clinical skills, and caring attitude needed to practice as a Physician Assistant anywhere and within any type of clinical practice.
7. Contribute knowledge to the medical community by performing research or other forms of academic activity through the students' Master's Project, which may be utilized as a community resource or published in a professional journal.
9. Develop in students an appreciation of the dignity of the individual and each individual's right to a quality life with consideration for the culture and diversity of each patient.
11. Highlight the importance of community service by incorporating service learning into the curriculum while fostering a commitment to future volunteerism in our students.
12. Encourage graduates to strive for excellence in clinical practice while employing professional ethics as a member of the health care team focused on service to others.

The Department of Physician Assistant Studies will prepare individuals to become valued members of the health care team licensed to practice medicine with physician supervision.

Department motto: *a posse ad esse* - from possibility to reality.
Application

Applications are made via the Centralized Application Service for Physician Assistants (CASPA) https://portal.caspaonline.org/. A supplemental Clarkson University PA program application will be required for qualified CASPA applicants. Deadline for applications through CASPA is March 1st. A rolling acceptance policy is being used. The class size will be approximately 30 students.

The prerequisites for admission are listed below. Be sure that you meet the Clarkson program prerequisites before submitting your CASPA application. This includes your score on the GRE. Please review the technical standards for the program. Those applicants who are invited to submit a supplemental application will sign a statement in that application that these standards can be met.

Prerequisites for the Clarkson PA program

- Bachelor's degree from a regionally accredited college/university
- 2 semesters Human/Animal/Vertebrate Anatomy & Physiology or 1 semester of Human/Animal/Vertebrate Anatomy and 1 semester of Physiology - minimum 6 hours total
- 2 semesters of Biology - one of which must be Microbiology (A&P cannot be used to fulfill the remaining course requirement) - minimum 6 hours total
- 2 semesters of Chemistry (Organic Chemistry recommended) - minimum 6 hours total

**GPA for the above courses must be 3.0 or higher**

- 1 semester of Humanities/Social Sciences: minimum 3 credits
- 1 semester Statistics: minimum 3 credits
- 1 semester Genetics: minimum 3 credits
- 1 semester Psychology (upper level recommended): minimum 3 credits

*Grades less than C are not accepted for any prerequisite (C minus not accepted). Prerequisite courses must be complete or in progress at the time of application. Overall GPA for all required courses must be 3.0 or higher*

All prerequisite coursework must be completed at an accredited institution within the United States or Canada.

GRE - with results sent to Clarkson University (school code 2084).

- A minimum of 500 hours of documented patient care experience is to be completed by the time of admission. Applicants with compensated hours of direct patient care will have an advantage. A portion of the required hours must be started by the time of application. Those that have not met the required hours by time of application must demonstrate a plan to obtain the remaining hours before classes begin if accepted into the program.
- It is required that applicants spend at least one day shadowing/observing a clinically practicing Physician Assistant. A separate (non-reference) Clarkson PA program form will be completed by the PA documenting the experience.
- Students who studied extensively outside of North America will require formal evaluation of those transcripts by the World Education Service (WES). Completion of TOEFL will be required for those for whom English is not the primary language. This requirement may be waived if the applicant has a bachelor's, master's, or doctoral degree from a regionally accredited U.S. college/university.
Simply meeting the prerequisites and submitting an application will not guarantee an interview or acceptance into the program. The admissions committee will decide which applicants are interviewed and which are selected for admission.

Technical Standards Requirements
The abilities and skills which candidates and students must possess in order to complete the education and training associated with Physician Assistant education are referred to as "Technical Standards." These same abilities and skills are essential for clinical practice as a Physician Assistant. The Technical Standards listed below reflect five categorical areas: observation, communication, critical reasoning (intellectual), motor and sensory, and behavioral/social and represent minimum competence levels. Students must attest that they meet these Technical Standards prior to or at the time of matriculation to the Clarkson University Department of PA Studies. Students found to be in violation of Technical Standards are at risk for dismissal from the program. Each standard is defined below and is followed by examples of indicators of minimum competence in that area. Reasonable accommodation for persons with documented disabilities will be considered on an individual basis, but a candidate must be able to perform in an independent manner.

Observation
Candidates must have sufficient capacity to observe in the lecture hall, the laboratory, the outpatient setting and the patient's bedside. Sensory skills to perform a physical examination are required. Functional vision, hearing and tactile sensation are required to properly observe a patient's condition and to perform procedures regularly required during a physical examination such as inspection, auscultation and palpation.

Communication
Candidates must be able to communicate effectively in both academic and health care settings. Candidates must show evidence of effective written and verbal communication skills. Candidates must be able to communicate with patients in order to elicit information, describe changes in mood, activity and posture and perceive nonverbal communications. Candidates must be capable of completing, in a thorough and timely manner, appropriate medical records and documents and plans according to protocol.

Motor
The ability to participate in basic diagnostic and therapeutic maneuvers and procedures (e.g., palpation, auscultation) is required. Candidates must have sufficient motor function to execute movements reasonably required to properly care for all patients. Candidates must be able to move freely about patient care environments and must be able to move between settings such as clinics, classroom buildings, and hospitals. In addition, physical stamina sufficient to complete the rigorous course of didactic and clinical study is required. Long periods of sitting, standing, or moving are required in classroom, laboratory and clinical experiences.

Intellectual
Candidates must be able to measure, calculate, reason, analyze and synthesize. Problem solving, one of the critical skills demanded of physician assistants, requires all of these intellectual abilities. Candidates must be able to read and understand medical literature. In order to complete the
Physician Assistant Studies program, candidates must be able to demonstrate mastery of these skills and the ability to use them together in a timely fashion in medical problem-solving and patient care.

**Behavioral and Social Attributes**
Candidates must possess the emotional health and stability required for full utilization of their intellectual abilities, the exercise of good judgment and the prompt completion of all academic and patient care responsibilities. The development of mature, sensitive and effective relationships with patients and other members of the healthcare team is essential. The ability to function in the face of uncertainties inherent in clinical practice, flexibility, compassion, integrity, motivation, interpersonal skills and concern for others, are all required. Candidates must be able to function effectively under stress and have the ability to accept constructive criticism and handle difficult interpersonal relationships during training.

**Supplemental Application**
Candidates will be required to certify that they have read and understand the Technical Standards of the Department of PA Studies at Clarkson University and attest that they have no condition -as noted above- that would interfere, inhibit, compromise or distract from their participation in the program.

The supplemental application is in addition to the CASPA application. After verification of the CASPA application the program will review and invite qualified applicants to complete a supplemental application. Supplemental applications received that have not been requested by the program will be disregarded and will not be considered for admission to the program. **The supplemental application is to be completed only at the request of the program.**

For the supplemental application to be completed, it will include:
- The application form
- Your personal statement describing how Clarkson’s values and its PA program will influence your PA education
- Certification of meeting technical standards *(form is in the application)*
- Reference letter from a practicing physician, Physician Assistant, or Nurse Practitioner if one was not included in your CASPA application *(form is in the application)*
- The CASPA and supplemental application must contain a total of three reference letters. If additional letters are needed to meet the minimum requirement, submit additional letters with the supplemental application. *(form is in the application)*
- Official transcript for all coursework not verified in the CASPA application
- Documentation of shadowing PA *(form is in the application)*
- GRE – school code . Must be official scores reported by ETS directly to CASPA
- $50.00 application fee (made payable to Clarkson University)

All materials are to be mailed directly to Clarkson University at:
Clarkson University Department of Physician Assistant StudiesBox 5882, 8 Clarkson Avenue
Potsdam, NY 13699-5882

The supplemental application must be returned within 30 days of the request from the program. If the supplemental application is not received within thirty days the entire application will closed and
applicant status will be moved to withdrawn. Incomplete applications, applications received after the deadline, or applications received without the application fee will not be considered.

Program Curriculum
The PA Program at Clarkson University is a professional degree program intended to prepare students academically and professionally for responsibilities and services as a Physician Assistant. This entry level master’s degree program consists of 82 credit hours divided into three phases that span 28 consecutive months.

1. The Didactic phase is the preclinical year and spans 13 months.
2. The Clinical phase consists of 14 months of supervised clinical education and coursework.
3. The Summative Phase consists of 1 month and consists of evaluation and preparation for the future as a graduate PA.

The curriculum is structured so that courses from term two build on courses in term One, etc. Therefore, opportunities for transfer of credit into the PA curriculum or advanced placement are not available. Supervised Clinical Practice Experiences are distributed among 9 clinical field experiences or “SCPE’s”. These experiences form the basis of the clinical and socialization processes for adaptation to the roles and functions of a Physician Assistant. A separate 5-week elective is designed for student research.

<table>
<thead>
<tr>
<th>Spring I</th>
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<tbody>
<tr>
<td>Introduction to the Profession</td>
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<td>Clinical Medicine I</td>
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<td>Basic Science I</td>
<td>PA504</td>
<td>2</td>
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<td>Pharmacotherapeutics I Patient</td>
<td>PA507</td>
<td>3</td>
</tr>
<tr>
<td>Assessment I</td>
<td>PA510</td>
<td>3</td>
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<td>The Patient and the PA I</td>
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<td>Pharmacotherapeutics II</td>
<td>PA508</td>
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</tr>
<tr>
<td>Patient Assessment II</td>
<td>PA511</td>
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<tr>
<td>The Patient and the PA II</td>
<td>PA514</td>
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<tr>
<td>Medical Informatics</td>
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<tr>
<td>Patient Assessment III</td>
<td>PA512</td>
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<tr>
<td>The Patient and the PA III</td>
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<td><strong>Semester Total</strong></td>
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</table>
Length of Program

Students must complete the program in 28 months unless granted a leave of absence for health or personal reasons. Any student that requests and is granted a leave of absence must complete the program in 40 months (28 month program plus 1 year).

Program Sequence and Advance Standing

Students are expected to complete the designated professional curriculum in the sequence specified. Each semester's course work is to be considered pre-requisite to the next semester.

1. Students may not enter the program with advanced standing.
2. Students are required to successfully complete, in sequence, all course work as full-time students.
3. There is no opportunity to progress into an advanced semester.
4. There is no opportunity to change the order of pre-clinical course work.
5. Elective courses are limited to the clinical year.

Students are expected to complete each semester on time as a cohort. Student progression will be a function of successfully passing all required courses in a semester. In the didactic phase of the program, any course failure after attempts at remediation will result in dismissal from the program. In the clinical phase, one rotation may be failed, but with remediation and a repeat of that rotation once only for the clinical phase. In that instance, the student's education may continue 5 more weeks. In the summative phase, the student must pass both the physical assessment exam and the comprehensive written final to pass PA 610 and to be recommended for graduation. If after remediation, a student cannot successfully pass either or both exams, they will not be recommended for graduation and will be released from the program.
Graduation Requirements
To graduate from the PA Program, and earn the Master of Science in Physician Assistant Studies degree (MS) candidates must:

- Achieve a grade of C or better for all courses in the program
- Achieve a minimum overall GPA of 3.00 or better at program completion
- Successful completion of a multi-station OSCE/history and physical skills assessment by score or remediation
- Successful completion of the comprehensive written final exam by score or remediation
- Be recommended for graduation by the Program Chair and Clarkson University Faculty
- Student must have paid all debts to the school and be in good standing

Clarkson Pre-PA Plan
High school seniors who apply to Clarkson University for undergraduate studies are eligible to apply for the Pre-PA Plan as part of their application. Applicants must demonstrate scholarship in Math and Science and a representative SAT/ACT score. Participation in health related courses and activities is encouraged.

The Pre-PA Plan is not a major or minor. Students must declare a major in an area of interest, but will be required to take the 10 prerequisite courses for the PA program as part of their degree. At least three prerequisite courses must be completed by the end of the second year. Patient care hours must be acquired during the first 2 years as well. At least 100 hours of the 500 hour total is required by this time.

Student advising will be done by the department of the declared major with input from the health science advisor and the PA advisor when needed. Pre-PA students will be expected to participate in PA program activities when possible.

Students must achieve and maintain a GPA of at least 3.25 throughout their undergraduate years. No grade less than B is acceptable for prerequisite courses. The students must also be free of any disciplinary problems. At the end of the second undergraduate year, the student will meet with the PA faculty to determine their continuation in the Pre-PA Plan. They must continue to acquire patient care hours and finish prerequisite courses while maintaining the above mentioned GPA. During the senior year, the student must still formally apply through the centralized process (CASPA). 50% of the available seats in each cohort will be held for Clarkson University pre-PA students. Each student that successfully completes the prerequisites of the pre-PA plan will be granted an interview and then compete for the available seats with other pre-PA applicants. Applicants that are not Clarkson pre-PA students will compete for the remaining seats.

Faculty in Department of Physician Assistant
Clinical Assistant Professors Joan Caruso, Katherine Matthis, Karyn Sullivan, Dawn White and Riane Dodge; Assistant Professor Roberto Fadda

Accreditation
The program has been granted continuing accreditation by the ARC-PA as of March 2015. The program has also been registered by the New York State Education Department. Graduation from an accredited program is a requirement of states for licensing and healthcare systems for credentialing. Accreditation-Continued is an accreditation status. The granting of Accreditation-Continued is an accreditation status granted when a currently accredited program is in compliance with ARC-PA Standards. Accreditation remains in effect until the program closes or withdraws from the accreditation process or until accreditation is withdrawn for failure to comply with the Standards.

Doctor of Physical Therapy (DPT) Program
Leslie Russke, PT, PhD, OCS-Interim Department Chair
lrussek@clarkson.edu
Vicki LaFay, PT, DPT, CSCS, EEEAA-Interim Associate Chair
vlafay@clarkson.edu

Mission
The domain of physical therapy is the application of human movement science to maintain or enhance activity level and social participation. Physical therapy is a health profession that includes evaluating, alleviating and preventing impairments, functional limitations, and disability from injuries, disease and other causes. Physical therapists serve a dynamic and comprehensive role in health care engaging in treatment, consultation, education and research.
The mission of the Department of Physical Therapy is:

- To graduate physical therapists who emulate the core values of the profession in their physical therapy practice; and
- For faculty, graduates, and students to contribute to the profession, community, and society through education, scholarship, service or practice.

Pre-Physical Therapy (Pre-PT) Undergraduate Concentration
To prepare candidates for entry into the graduate physical therapy professional curriculum, the University offers an undergraduate Pre-Physical Therapy (Pre-PT) Concentration. The Pre-PT Concentration consists of three unique aspects:

- At least 50% of the available seats in each cohort will be held for Clarkson University pre-PT undergraduate students who successfully complete all of the necessary pre-requisite requirements.
- A physical therapy program adviser. In addition to your major adviser, you'll be assigned a second faculty adviser from the Department of Physical Therapy. This extra mentoring relationship adds another dimension of support to your experience. You and your PT adviser will work together to define your career goals, balance your PT course requirements with major requirements, and make a successful transition to the Doctor of Physical Therapy program.
- A solid foundation in Problem-Based Learning, which is a cornerstone of the graduate program. The pre physical therapy courses will introduce you to this student-centered, collaborative and self-directed education model. Problem-Based Learning (PBL), based on patient case studies, more closely resembles actual clinical experience. It better prepares you
to be a self-motivated lifelong learner, which is essential to being a competent healthcare professional.

- The graduate professional curriculum (DPT) emphasizes problem-based learning, technology in education, a strong basic science partnership, and a strong commitment to cultural diversity. The Pre-PT Concentration provides an introduction to problem-based learning.

**Pre-PT Concentration Admissions Requirements**

Pre-PT Concentration applicants must complete all the required material for general Clarkson undergraduate admission, and indicate on the undergraduate application that Special Advising - Physical Therapy is desired. Of the required recommendations by the University, applicants to the Pre-PT Concentration should have at least one academic, and preferably one in a health-care field.

**Length of Pre-PT Concentration**

An undergraduate degree normally takes four academic years. There are plans of study in some undergraduate majors that can be completed in three years.

**Doctor of Physical Therapy Application Requirements**

- Completion of baccalaureate degree (BS, B.A., etc.) prior to matriculation into the professional curriculum; with an overall grade point average greater than or equal to 3.2
- Take all the necessary *pre-requisite courses* with a grade point average greater than or equal to 3.2 in all pre-requisite courses and no grade lower than a C in these courses. Submit documentation of a minimum of 50 hours of observation/volunteer or work experience in physical therapy and/or another healthcare setting, of which a minimum of 30 hours must be completed under the supervision of a physical therapist.

All applications to the graduate physical therapy program *must* be submitted through the Physical Therapy Centralized Application Service (PTCAS - www.ptcas.org).

**Prerequisite Courses**

- Three Biology courses:
  - Cellular and Molecular Biology/Lab (Clarkson course: BY160/BY162), 5 credits
  - Human Anatomy and Physiology I/Lab (Clarkson course: BY 471/BY 473), 5 credits
  - Human Anatomy & Physiology II/Lab (Clarkson course: BY 472/BY 474) 5 credits

- Two Chemistry courses:
  - General Chemistry I with lab (Clarkson course: CM 131 or CM 103/105: Structure and Bonding with lab) 4 or 5 credits
  - General Chemistry II with lab (Clarkson course: CM 132 or CM 104/106: Chemical Equilibrium and Dynamics with lab) 4 or 5 credits

- Two Physics courses:
  - Physics I with lab (Clarkson course: PH 131 or PH 141) 4 credits
  - Physics II with lab (Clarkson course: PH 132 or PH 142) 4 credits

- One statistics course:
• Statistics (Clarkson courses: STAT 282, STAT 284, STAT 318, STAT 383) 3 credits

Two Psychology Course
• General Psychology (Clarkson course: PY 151) 3 credits
• Another 3 credit Psychology course, we recommend Developmental Psychology, life span (Clarkson course: PY 370) 3 credits

Medical Terminology

Academic Learning Experiences
The DPT curriculum utilizes a problem-based learning (PBL) approach to education, providing students an active, exciting and effective way to learn. PBL is student-centered, collaborative, self-directed, and an active learning process based on patient case studies. Students are prepared for clinical practice and lifelong learning.

Clinical Learning Experiences
Clinical internships are integrated into the curriculum throughout the educational process. To prepare students optimally for work in a variety of clinical settings, Clarkson continuously develops new clinical internship sites. Contractual relationships exist with many clinical internship sites in the North Country of New York State, throughout the United States, and some international sites as well.

The DPT Curriculum
The DPT professional curriculum is a full-time program, starting in the fall semester. Each year is divided into three semesters (trimesters), and includes Clinical Education. The professional curriculum takes three years to complete, finishing in May of the third year.

<table>
<thead>
<tr>
<th>Fall — Semester 1</th>
<th>Cr. Hrs.</th>
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<tr>
<td>PT505</td>
<td>Foundational Sciences For Physical Therapy</td>
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<td>Professional Found For Physical Therapy</td>
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<td>PT 607B</td>
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<td>PT508</td>
<td>Principles of Measurement</td>
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<td>Professional Practice Preparation</td>
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<td>Fall — Semester 7</td>
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<td>PT528</td>
<td>Physical Therapy Research Design</td>
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<td>Fall — Semester 4</td>
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<td>PT537</td>
<td>Professional Practice II</td>
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<td>PT605</td>
<td>Neuromuscular Physical Therapy I</td>
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<td>PT607A</td>
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<td>Physical Therapy Data Analysis</td>
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<td>PT627B</td>
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<td>PT645</td>
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<td>PT648</td>
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<td>PT657</td>
<td>Advanced Clinical Skills</td>
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<tr>
<td>PT677</td>
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**Facilities**
The Doctor of Physical Therapy (DPT) curriculum is housed in Clarkson Hall. The Department of Physical Therapy provides a focus on health sciences education, treatment and research in physical rehabilitation for the University and the community. Clarkson Hall houses Clarkson’s academic physical therapy programs.

**Program Length**
Students complete within 2 2/3 years or 8 semesters.

**Accreditation Status**
The Doctor of Physical Therapy program at Clarkson University is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE). The program was originally accredited on Nov. 16, 2001, reaffirmed on Oct. 28, 2009, and reaffirmed again on April 26, 2017. CAPTE is the sole accreditation agency for physical therapy programs in the nation. It is our policy to maintain accreditation, and our next site visit is scheduled for the fall of 2026. Licensure through the state is required for practice as a physical therapist. Licensure is gained through successful completion of the National Physical Therapy Examination offered by the Federation of State Boards of Physical Therapy.

**Faculty in Department of Physical Therapy**
Associate Professor Leslie Russek; Assistant Professors Ali Boolani, Moshe Marko; Clinical Full Professor Stacey Zeigler; Associate Clinical Professors Vicki LaFay and Rebecca Martin. Assistant Clinical Professor Christopher Towler; Clinical Instructors Heather Shattuck.
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.

Bioscience & Biotechnology M.S. (IBB-MS) Degree

Objectives
Educate bioscience students in the advanced content knowledge and applied laboratory skills needed to work in bioscience and biotechnology industry, or to continue on to doctoral-level graduate or professional studies.

Outcomes
IBB-MS degree recipients will
1) Have an advanced understanding of basic and applied bioscience and biotechnology.
2) Be familiar with and be able to use the instrumentation and techniques that are the core of contemporary bioscience and biotechnology research.
3) Be able to use quantitative techniques to analyze data.
4) Be cognizant of the ethical and policy implications of biotechnology.

Program Prerequisite
Either: B.S. or B.A. in a Bioscience, Chemistry, or other Math, Science or Engineering affiliated-discipline that included coursework in cell & molecular biology, genetics, and organic chemistry.

Curriculum overview
BY580 Advanced Cell Biology (3 cr., Fall)
BY582 Molecular Genetics (3 cr., Spring)
Either: BY512 Molecular Biology Lab (4 cr., Fall) or CM570 Biochemistry & Biotechnology Laboratory (3 cr., Spring)
BY622 Graduate Seminar (2 cr., Every semester)
Bioethics or Policy Elective (3 cr.)
Quantitative Skills Elective (3 cr.)
Bioscience & Technology Electives (6 cr.)
Thesis Research Credits (no more than 10 cr.)

Total = 30 cr. minimum

ELECTIVES (Note that other appropriate courses may be substituted in each category, with approval of the graduate student’s advisor and IBB-MS program chair)
**Bioscience & Biotechnology Electives (6 credits minimum)**

BY 510  Developmental Biology (3 cr., Spring)
BY 512 Molecular Biology Lab (4 cr., Fall)
BY 518 Principles of Toxicology and Epidemiology (3 cr., Fall)
BY 519 Immunology (3 cr., Fall)
BY 520 Microbiology (3 cr., Spring)
BY 522 Evolution (3 cr., Fall)
BY 524 Experimental Evolution Lab (2 cr., Fall)
BY 525 Biological Systems & Environ Change (3 cr., Odd Springs)
BY 526 Biophysics (3 cr.)
BY 528 Conservation Biology (3 cr., Even Springs)
BY 531 Limnology (3 cr., Even Falls)
BY 532 Limnology Laboratory (2 cr., Even Falls)
BY 540 Introduction to Biomedical Rehabilitation Engineering and Science (3 cr., Fall)
BY 548 Medical Microbiology (3 cr., Spring)
BY 553 Pharmacology Lab (2 cr., Even Springs)
BY 555 Cell & Molecular Biology of Cancer (3 cr., Spring)
BY 560 Comparative Physiology (3 cr., Spring)
BY 561 Neurobiology (3 cr., Fall)
BY 562 Comparative Physiology Laboratory (2 cr., Spring)
BY 571 Anatomy & Physiology I (3 cr., Fall)
BY 573 Anatomy & Physiology Lab I (2 cr., Fall)
BY 576 Current Topics in Biology & Medicine (3 cr., Spring)
BY 586 Molecular Biotechnology (3 cr., Fall)
BY 588 Stem Cells and Regenerative Medicine (3 cr., Spring)
BY 604 Molecular Pharmacology (3 cr., Fall)
BY 608 Teaching in Bioscience (2 cr., Even Springs)
BY 615 Gene Regulatory Networks (4 cr., Even Springs)
BY 650 Biochemistry I (3 cr., Fall)
BY 651 Biochemistry II (3 cr, Spring)
BY 652 Pharmacology (3 cr., Fall)
BY 690 Critical Thinking & Research Proposals (2 cr., Spring)
CM 525 Advanced Bioanalytical Chemistry (3cr, Spring)
CM 530 Colloids & Interfaces (3cr, Spring)
CM 544 Medicinal Chemistry (3cr, Variable)
CM 553 Medicinal and Pharmaceutical Biomaterials (3 cr, Spring)
CM 563 Protein Chemistry & Proteomics (3 cr, Variable)
CM 566 Bioelectronics & Bionanotechnology (3cr, Variable)
CM 567 Biofuel Cells – Design and Applications (1 cr, Spring Odd Years)
CM 570 Biochemistry & Biotechnology Laboratory (3 cr, Spring)
CM 575 Sustainable Nanotechnology (3cr, Fall)
CM 583 Introduction to Polymer Science (3 cr., Spring)
EE 585 Neural Engineering (3cr, Fall)
ES 552 Biomaterials & Biomedical Engineering Applications (3 cr., Even Years)
**Bioethics or Policy Electives (3 credits minimum)**
BIE 510 Principles of Biomedical Ethics (3 cr., Fall, every year, online)
BIE 525 Public Health Ethics (3 cr., Winter, online)
BIE 555 Research Ethics 1 (3 cr., Fall, online)
BIE 574 Contemporary Issues in Bioethics (1.5cr., Spring, Even Years, online)
BIE 590 Clinical Ethics (3 cr., Fall, online)
EV 532 Environmental Sustainability & Risk Analysis (3 cr., Spring)
HIST 520 Medicine & Society in America (3 cr., Spring)
HIST 535 History of Medicine in Europe and North America
HIST 521 History of Public Health in America
POL 570 Environmental Policy (3 cr., Fall)
POL 571 Energy Policy (3 cr., Spring)
POL 580 Law & Bioethics (3 cr., Fall)
SOC 530 Health, Wealth, Inequality and the Environment (3 cr., Spring)

**Quantitative Skills Electives (3 credits minimum)**
IA640 Information Visualization (3 cr., Fall & online)
IA530 Probability & Statistics for Analytics (3 cr., Fall & online)
IA650 Data Mining (3 cr., Spring)
BY514 Bioinformatics (3 cr., Spring)
BY610 Ecological Statistics & Experimental Design (3 cr., even-year Fall)

**EXAMPLE TWO-SEMESTER PLAN (30 CREDITS MINIMUM):**

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>CREDITS</th>
<th>COURSE TITLE</th>
<th>CREDITS</th>
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<tr>
<td>BY580 Advanced Cell Biology</td>
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<td>BY582 Molecular Genetics</td>
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<td>BY512 Molecular Biology Lab</td>
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<td>Bioscience &amp; Biotechnology Elective</td>
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<td>Bioscience &amp; Biotechnology Elective</td>
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<td>Quantitative Skills Elective</td>
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<tr>
<td>Total Credits</td>
<td>14</td>
<td>Total Credits</td>
<td>16</td>
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Program Curriculum

The Bioethics Program at Clarkson University and the Icahn School of Medicine at Mount Sinai is a professional degree program intended to prepare students academically and professionally for responsibilities and services as a Bioethicist. This Master of Science degree program consists of 39 credit hours. The degree can be taken full time taking three or more courses per term or part-time taking one or two course(s) per term. There are three specializations within the Bioethics Degree: Clinical Ethics, Research Ethics and Bioethics Policy.

Course Plan for a full time student in Clinical Ethics Specialization

<table>
<thead>
<tr>
<th>Course Plan for a full time student in Clinical Ethics Specialization</th>
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<tbody>
<tr>
<td>Summer</td>
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<tr>
<td>Proseminar in Health &amp; Human Values</td>
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<tr>
<td>Course: BIE500</td>
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<tr>
<td>Credit Hours: 3</td>
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<tr>
<td>Fall</td>
</tr>
<tr>
<td>Biomedical Ethics</td>
</tr>
<tr>
<td>Course: BIE 510</td>
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<tr>
<td>Winter</td>
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<td>Health Care Policy</td>
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<tr>
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<td>Credit Hours: 3</td>
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<tr>
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<td>Course: BIE 610</td>
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<tr>
<td>Spring II</td>
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<tr>
<td>Bioethics &amp; The Law</td>
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Course Plan for a full time student in Research Ethics Specialization
# Course Plan for a full time student in Bioethics Policy Specialization

<table>
<thead>
<tr>
<th>Season</th>
<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td><strong>Summer</strong></td>
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<td><strong>Fall</strong></td>
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<td></td>
<td>Research Ethics I</td>
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<td>Health Care Policy</td>
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<td></td>
<td>Research Ethics II</td>
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<td><strong>Spring II</strong></td>
<td>Bioethics &amp; The Law</td>
<td>BIE 530</td>
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<td>Online Practicum in Research Ethics</td>
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<td></td>
<td>Plus one elective of your choice</td>
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<td></td>
<td><em>Total</em></td>
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### Course Plan for a full time student in Bioethics Policy Specialization

<table>
<thead>
<tr>
<th>Season</th>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer</strong></td>
<td>Proseminar in Health &amp; Human Values</td>
<td>BIE500</td>
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<td><em>Term Total</em></td>
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<tr>
<td><strong>Fall</strong></td>
<td>Biomedical Ethics</td>
<td>BIE 510</td>
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<tr>
<td></td>
<td>Medicine and Social Justice</td>
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<td></td>
<td>Foundations of Bioethics Policy</td>
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<td><em>Term Total</em></td>
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<td><strong>Winter</strong></td>
<td>Health Care Policy</td>
<td>BIE 520</td>
</tr>
<tr>
<td></td>
<td>Public Health Ethics</td>
<td>BIE 525</td>
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</table>
Graduation Requirements

To graduate from the Bioethics Program, and earn the Master of Science in Bioethics degree (MSB), candidates must:

- Achieve a minimum overall GPA of 3.00 or better at program completion
- Successfully complete the comprehensive Capstone Assessment by score or remediation
- Be recommended for graduation by the Program Chair and Clarkson University Faculty
- Have paid all debts to the school and be in good standing

Academic Performance Standards

Standards of acceptable performance (cognitive and psychomotor) for courses are communicated to students in writing via the syllabus and, for onsite courses, orally reviewed at the introduction of the course.

The policy of 3.00 or better in a graduate professional program has been adopted to better ensure student’s preparation for future sequential course work. Students will be given feedback at the completion of each exam.

Performance in didactic courses is commonly assessed by written exams, oral presentations and/or research papers, as well as final written (cognitive) exams. In designated courses, psychomotor performance may be assessed by target skill competency exams and small group exercises. During the didactic phase of the program, grades for cognitive performances will be recorded as a raw score and a percentage. At the end of each course the percentage scores will be converted to a grade, A through F for each of the core Bioethics courses.

To remain in good academic standing, please refer to the academic standing section. Additionally, Clinical Ethics and Research Ethics students may not progress to the Onsite Practicum with a cumulative GPA of less than 3.00.

Length of Program

<table>
<thead>
<tr>
<th>Master Project II</th>
<th>BIE 635</th>
<th>3</th>
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<tbody>
<tr>
<td><strong>Term Total</strong></td>
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<tr>
<td><strong>Spring II</strong></td>
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<tr>
<td>Bioethics &amp; The Law</td>
<td>BIE 530</td>
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<td>Online Practicum in Bioethics Policy</td>
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<td>Masters Project Part 3 (Tuition Waived)</td>
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<tr>
<td>Capstone</td>
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<td><strong>Term Total</strong></td>
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<tr>
<td>Plus one elective of your choice</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>
The majority of students finish in three years. Students must complete the program in 5 years unless granted a leave of absence for health or personal reasons. Any student that requests and is granted a leave of absence must submit a letter to the academic committee requesting a return to studies.

Faculty in Bioethics
Adjunct Professor Kevin Ashby, Robert Baker, Ellen Tobin Ballato, Amy Bloom, Paul Cummins, Nada Gligorov, Jane Oppenlander, Ilene Penn, Rosamond Rhodes, Henry Sacks, Abraham P Schwab, Bonnie Steinbock, Marty Strosberg; Associate Professor Sean Philpott-Jones

MS in Computer Science Program
Christopher A. Lynch, Program Chair
clynch@clarkson.edu

The Department of Computer Science offers graduate programs leading to degrees of Master of Science (offered interdisciplinary with the Department of Electrical and Computer Engineering) and Doctor of Philosophy in Computer Science (See School of Arts & Sciences). These programs are designed to increase the student’s fundamental knowledge and to give the student guidance and experience in research. A graduate student pursues these objectives by taking advanced courses, participating in seminars, and carrying out and reporting on a research project. The department provides the advantage of close personal association between graduate students and faculty, giving special attention to individual needs and interests.

Requirements for MS in Computer Science
In addition to the general requirements for the MS degree that are established by the University, a student is required to satisfy the following set of requirements:
1. The program requires a minimum of 30 credit hours of graduate level work.
2. At least 20 credit hours must be earned in residence at Clarkson.
3. Each student’s program of study must be approved by the Advisory Committee.

Those students who are not fully prepared to pursue graduate work in computer science may be required to take the course CS 511, Foundations in Computer Science. In addition, students with very little to no background in computer science may be required to take undergraduate computer science courses, for which graduate credit will not be given. Course and seminar work will comprise a minimum of 20 credit hours. To ensure some breadth in the program, four courses must satisfy the following:
Two foundation courses must be taken, as described below
   CS541 Introduction to Automata Theory and Formal Languages
   CS547 Computer Algorithms
Two courses from the following set, where each of these courses requires a substantial amount of programming.
   CS544 Operating Systems
   CS545 Compiler Construction
   CS550 Software Design and Development
For those students who can demonstrate that they have successfully completed comparable graduate-level courses before coming to Clarkson, the Advisory Committee may waive the requirement that the student take these specific courses upon request from the student.

1. At least two restricted elective courses will be taken from the courses offered in computer science or computer engineering departments as selected by the student and their advisor. Of these 2 restricted elective courses, one must be a course that focuses on research topics in computer science and one must be a computer engineering course with relevant emphasis on computer science topics. Students should consult with their advisors to identify courses in these categories.

2. Two seminar credits: To earn a seminar credit, students must enroll in a seminar course in Computer Science.

3. Thesis credit will comprise a maximum of 10 credit hours of the 30 credit hour minimum. All students must have a research advisor by the end of their first semester of study and must submit a research proposal to the Examination Committee by the end of the semester before they plan to graduate. The Examination Committee shall consist of a minimum of three faculty members. All students must complete a thesis and defend it orally to their Examination Committee. Two copies of the completed thesis must be submitted to the University.

Program Length
All work done for the master’s degree in computer science is to be completed within five calendar years, although it is normative to complete this degree in 2 years.

Faculty in Computer Science
Professor Daqing Hou, Christopher Lynch; Associate Professors Alexis Maciel, Jeanna Matthews, Christino Tamon; Assistant Professors Natasha Banerjee, Sanjib Banerjee, Faraz Hussain, Yaoqing Liu

Data Analytics MS
Key Contacts
Boris Jukic, Co-Director of Data Analytics &Professor of Operations & Information Systems
bjukic@clarkson.edu
Joseph Skufca, Co-Director of Data Analytics &Professor and Chair of Mathematics
jskufc@clarkson.edu
Daqing Hou, Co-Director of Data Analytics, Associate Professor and Director of Software Engineering
dhou@clarkson.edu

The MS-Data Analytics degree provides students with the skills to be effective professionals in a highly sought-after field of identifying, acquiring, managing, presenting, analyzing and interpreting large amounts of data in a variety of professional fields and organizational settings. The program offers close faculty student interaction with core courses ensuring that students acquire common set of key critical skills in areas of data management, decision analysis, statistics, data mining and
knowledge discovery. In addition, the programs offers a variety of elective courses in various areas of data analytics form which students can build additional level of proficiency and expertise. Upon completion of this program students will possess skills and demonstrate proficiency in the core areas of data analytics and will be able to apply them to one or more specialized contexts of business, engineering or science. Students will develop deep understanding of how to identify and satisfy data requirements of a variety of stakeholders, working closely across organizational boundaries to create, analyze and present valuable information. Their acquired expertise will enable them to manage, review, analyze, and evaluate data at a very advanced level for critical decision making purposes. These skills will enable them to secure positions in private enterprises as well as government and other intuitions with job titles such as Data Analyst, Data Solution Analyst and Data Scientist, among many others.

Prerequisites
The MS program requires completion of foundation courses in three specific areas: Calculus, Mathematical Statistics and Basic Programming. These courses can be completed as part of the regular undergraduate degree program or through pursuing the Summer Analytics Foundation program offered by this program, lasting from June to August preceding the start of the regular fall semester.

Degree Requirements
The (36) thirty-six credits of the MS degree program consist of six three-credit core graduate courses, four three-credit graduate elective courses, and a six-credit capstone course based on a sponsored project work. The core course titles are:
IA 510 - Database Modeling, Design and Implementation
IA 530 - Probability and Statistics for Analytics
IA 605 – Data Warehousing
IA 640 - Information Visualization
IA 650 - Data Mining
IA 651 – Machine Learning

Some of the core courses may be waived if the students can demonstrate that their previous undergraduate or graduate coursework contains equivalent material. In those cases, students will be required to take a greater number of elective courses to satisfy 36-credit program requirement. Graduate elective courses are offered in a variety of areas and they include but are not limited to the following:

IA 630 - Modeling for Insight
IA 626 - Big Data Processing and Cloud Services
IA 628 - Introduction to Big Data Architecture and Applications
OM 680 - Strategic Project Management
MK 696 – Marketing Research Methods
EC 611- Econometrics
ES 505 - Design of Experiments
EE 574 - Pattern Recognition
ME 529, Stochastic Processes for Engineers
CS 551 - Artificial Intelligence
CS 559 - Human Computer Interaction
EE 501 - Digital Signal processing
CS 549 - Computational/Machine Learning

The electives list is not exclusive. We anticipate that students entering the program will have an interest in working in a focused area of data analytics. Students will build an individualized plan of study through the selection of course electives that align with their intended focus. Faculty advisor will work with individual students to choose proper electives by exploring all graduate courses offered in the curriculum of the different schools at Clarkson University.

IA690 - Capstone Project is a course centered on a sponsored data analytics projects with interdisciplinary teams. Capstone projects, depending on project parameters could consist of a 2 unit seminar w/4 unit project (consistent with engineering curriculum as currently offered) and/or be a mentored capstone of 6 total units. Depending on the nature of the capstone and its sponsorship, projects could be on-site fieldwork intensive.

Program Length
Expected program length for the MSDA (residential) is three semesters, but it can be extended and expected program length for the MSDA (distance) is (5) five quarters, but it can be extended.

Data Analytics Faculty
Boris Jukic, Professor of Operations & Information Systems
Joseph Skufca, Professor and Chair of Mathematics
Daqing Hou, Associate Professor and Director of Software Engineering
Sumona Mondal, Associate Professor, Mathematics
Tyler Conlon, Instructor and Director of Projects and IT Infrastructure, Data Analytics
Bebonchu Atems, Associate Professor of Economics & Financial Studies
William MacKinnon, Assistant Professor of Operations & Information Systems

Engineering Science Programs
William Jemison, Dean of the Wallace H. Coulter School of Engineering
wjemison@clarkson.edu

Clarkson University offers MS and PhD programs in Engineering Science for qualified students who desire interdisciplinary graduate study in engineering that does not fit within any of the four engineering departments shown below.

- Chemical and Biomolecular Engineering
- Civil & Environmental Engineering
- Electrical & Computer Engineering
- Mechanical & Aeronautical Engineering
Requirements for MS degree
BS in Engineering or Science (Chemistry, Computer Science, Math or Physics; other degrees considered on a case-by-case basis).
1. The following are minimum requirements:
   • Minimum of 30 credits beyond BS
   • Minimum of 18 credits of graduate course work (12 credits in engineering).
   • GPA for graduation is B (3.0/4.0).
   • 2 credits of seminar work (in engineering or science).
   • Minimum of 6 credits of thesis.
   • 20 of the 30 credit hour must be earned in residence
   • 1 academic year of full time study beyond the Baccalaureate
2. The research advisor must be a member of Clarkson School of Engineering (CSoE) (may be a courtesy appointment).
3. MS Thesis Committee will consist of a minimum of three faculty members (PhD) with at least two from CSoE.

Requirements for PhD Degree
MS in Engineering or Science (Chemistry, Computer Science, Math or Physics; other degrees considered on a case-by-case basis).
1. The following are minimum requirements:
   • Minimum of 60 credits beyond MS, 90 credits beyond the BS
   • Minimum of 39 credits of graduate course work (minimum of 24 credits in engineering).
   • GPA for graduation is B (3.0/4.0).
   • 6 credits of seminar (in engineering or science).
   • PhD Thesis Committee: Minimum of five faculty Members (PhD) with at least three from CSoE.
2. A maximum of 30 credit hours transfer credit (grade of B or better).
3. All work to be completed within seven years after the candidacy procedure is completed
4. The research advisor must be a member of CSoE (can be a courtesy appointment).

Sequence of Examinations:
1. Qualifying Examination: A written qualifying exam is required within one year of admission to the PhD program. The qualifying exam will be administered by the Chair of the student’s PhD Committee or the researcher advisor’s departmental graduate committee. The outcome of the exam is determined by a vote of the respective committees, with no more than one dissenting vote permitted for passage. Failure to pass the qualifying examination twice is grounds for dismissal from the program.
3. Examination on the Dissertation: Administered by PhD Thesis Committee at least one year after passing the proposal defense.

Faculty in Engineering Science
*Please see the Faculty Directory for all Engineering Faculty*
Master of Science in Engineering Management

Michael Walsh, Executive Director of Engineering Management Programs
mwalsh@clarkson.edu

Clarkson University’s Master of Science in Engineering Management brings together world-class engineering and technology expertise with best practices in business to deliver an unparalleled education and an exceptional degree, specifically for rising engineering and technical professionals. Our mission is accomplished by focusing on the three areas key to professional education including curriculum & instruction, people, and learning environment.

Prerequisites
The MS in Engineering and Management (MSEM) program requires an engineering/technical degree OR relevant experience in an engineering/technology based organization.

Degree Requirements
The thirty credits required for the MS in Engineering and Management consists of 10 courses, 7 core and 3 electives. Program courses are illustrated below:

Core Course:
- Financial Analysis and Cost Management
- Decision and Risk Analysis
- Strategic Project Management
- Operations Strategy and International Competitiveness
- Negotiations and Relationship Management
- Quality Management and Process Control
- Capstone Project

Elective Courses:
- Advanced Construction Engineering
- Sustainable Infrastructure and Building
- Special Topics in Engineering Science
- Operations Management and Factory Physics
- Law for Engineers
- Advanced Topics in Supply Chain Management
- Environmental Sustainability and Risk Analysis
- Environmental Law and Policy
- Leading Organizational Change
- Optimization Methods
- Marketing Management for Innovation
- Database Modeling, Design, and Implementation
- Information Visualization
- Data Warehousing
- Modeling for Insight
The Doctor of Philosophy PhD degree in Materials Science and Engineering (MSE) focuses on advanced materials and their application across the full spectrum of technical challenges around the world. The objective of this program is to offer students from diverse science and engineering backgrounds the opportunity to develop special competence in one or more of the MSE application areas and to demonstrate their ability to conduct research and add to the body of knowledge in materials science or materials engineering. This MSE program is designed to provide graduate students with an in-depth, fundamental understanding of metals/alloys, polymers, ceramics, composites, and advanced materials, as well, an understanding of the relationships among structure, properties and processing. Applications of advanced materials in areas of biotechnology, electronic devices, alternative energy, and the environment, are at the forefront of technology development. Companies such as Corning, General Electric, IBM, and GLOBALFOUNDRIES (to name only a few) and the Federal Government seek scientists and engineers with MSE degrees to sustain their competitive edge.

The MSE graduate program is administered through its Director (materials@clarkson.edu), who works closely with the Dean of Engineering and the Dean of Arts & Sciences. The MSE graduate program is closely associated with Clarkson’s Center for Advanced Materials Processing, whose mission is "to perform innovative research and conduct educational efforts on the synthesis and processing of advanced materials of interest to industry." PhD MSE students are advised and mentored by faculty from appropriate underpinning disciplines and/or faculty with MSE degrees and experience.

Given the complex nature of advanced materials an interdisciplinary program has been developed, underpinned by courses from several academic disciplines, including physics (PH), chemistry (CM), mechanical engineering (ME), chemical engineering (CH), electrical engineering (EE) and engineering science (ES)

Students seeking the MSE PhD must complete:

- 30 hours of classwork (courses)
• A comprehensive qualifying examination (usually taken in the 3rd semester of matriculation)
• 54 hours of research, completing dissertation on an appropriate MSE topic
• 6 hours of MAE or CBE Seminar

Students seeking a PhD in MSE may enter the program with either a MS/ME in MSE or one of the supporting disciplines or a BS/BE in MSE or in one of the supporting disciplines (mechanical engineering, chemical engineering, civil engineering, chemistry or physics). Those entering with a MS/ME degree may transfer up to 30 credit hours from the completed courses of their MS/ME program, if the MSE program director deems these courses equivalent to the courses listed below.

**Course Requirements**
PhD students are required to take 10 courses (30 hours) from the 3 areas below.

**Materials Science Core Courses** (required)
- MSE 551 Advanced Characterization of Materials
- MSE 560 Advanced Materials Science and Engineering

**Materials Properties and Applications** (select 4 courses)
- ME 503 Additive Manufacturing
- ME 557 Advanced Mechanics of Composite Materials
- ME 590 Advanced Welding Metallurgy
- ME 591 Selected Topics in Materials Engineering
- ME 595 Principles of Physical Metallurgy
- CM 530 Colloids and Interfaces
- CM 553 Introduction to Biomaterials
- CM 566 Bioelectronics and Bionanotechnology
- CM 583 Introduction to Polymer Science
- CM 584 Functional Polymer Systems
- CM 585 Nanostructured Materials
- CH 515 Polymer Materials
- PH 528 Intermolecular Forces in Modern Nanotechnology
- PH 589/EE 543 Physics of Semiconductor Devices
- EE 539 Dielectrics
- EE 541 Electronic Devices for IC Simulation
- ES 552 Biomaterials and Biomedical Engineering Applications

**Materials Processing and Characterization** (select 2 courses)
- ME 637 Particle Transport, Deposition and Removal
- CM 551 Manufacturing Implications of Advanced Materials Processing
- ES 557 Microelectronic Circuit Fabrication
- ES 564 Corrosion Engineering
- PH 636 Scanning Probe Techniques in Soft Condensed Matter Physics

**Program Length**
Students entering with an MS/ME may expect to reach completion of the program within three to five years. Students entering with a BS/BE may expect to complete the program within five years.

**Faculty in Materials Science Engineering**
The program is multi-disciplinary in its approach and engages faculty from across the divisions of the School of Engineering and the School of Arts and Science to offer a diverse perspective on research and study relating to the Materials Science Engineering curriculum. Please see faculty listings for Mechanical Engineering, Chemistry, Physics, Electrical and Computer Engineering, and Engineering Science.
SPONSORED RESEARCH SERVICES
Gina-Lee Glauser, Vice President for Research and Scholarship
gleelauser@clarkson.edu

The 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 department. 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.

Some typical areas of sponsored research in engineering and science include: crystal growth, aerosol kinetics and scavenging, light scattering, stability of colloidal dispersion, strength of materials, metallic systems, ceramic surfaces, phase transitions, bio-engineering, heat transfer and mass transfer, thin film adsorption, film flow stability, transition and turbulence and active flow control, nonlinear wave motion, dynamical systems, chaos and control, computational applied math, optimization and numerical p.d.e.s., wave forces, surface shear viscosity, nutrient regeneration in lakes, flow slides, copper and zinc protein, nanotechnology, artificial intelligence, oxygenation of metal complexes, asynchronous networks, communication networks, detection of random signals, renewable energy production, power transmission, energy conversion, plasma deposition, osmotic work, corrosion, data and complex systems analytics, health technologies, and water quality. In the business area, studies have been conducted relative to dispute settlement techniques, scientific and technical information systems, effects of organizational changes, economic impact of environmental damage from acid rain, marketing approaches, pricing environmental alternatives, banking systems, and monetary policies.
ACADEMIC CENTERS

Center for Advanced Materials Processing (CAMP)
A New York State Center for Advanced Technology
Marilyn Miller Freeman, Director
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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 NYS. 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 (CMP), 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 Air Resources Engineering and Science (CARES)
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The presence of contaminants in the environment can have a wide variety of negative effects including impacting public health, limiting visibility, deteriorating buildings and monuments, acidifying lakes and rivers, and damaging forests and crops. The negative health effects of breathing atmospheric contaminants also impact the indoor environment since ambient air is transported indoors along with its pollutants where indoor sources can add to the problems. Although we have substantially improved the ambient air quality over the past 40 years, there are still a number of
problems that are attributed to air pollution. Recent studies have found strong correlations between changes in particle concentrations and increased mortality. There has been a sharp rise in childhood asthma, and many areas of the country continue to fail to meet national ambient air quality standards. Worldwide much of the world's air quality fails to meet the quality specified by the World Health Organization's guidelines.

Clarkson University has significant resources in people and equipment that focus on the management of air, water and soil pollution. CARES is the center that brings together this world-class expertise focused on multi-media sampling and analysis, receptor modeling, atmospheric deposition, and the application of experimental and computational fluid dynamics to pollution problems. In addition, we are developing new modeling, measurement, and flow management tools that can provide critical information to state and federal regulatory authorities that will help to improve environmental quality. CARES laboratory and office space, and equipment including an aerosol wind tunnel, a high-speed aeronautical wind tunnel, a Beowulf computer cluster, field sampling systems, and world class analytical equipment are available to 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/cares

**Center for Rehabilitation Engineering, Science, and Technology (CREST)**

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The Center for Rehabilitation Engineering, Science and Technology was established at Clarkson University in 2005. Its mission is to educate, mentor and train students to be able to integrate and apply a combined scientific, analytic, technological and business approach to emerging biomedical engineering and biomedical science areas. It is of note that biomedical engineering is the most rapidly growing field of engineering, with outstanding biomedical job prospects, and with half of the undergraduates being female, a ratio that exists in no other engineering discipline.

The Center for Rehabilitation Engineering, Science and Technology takes a unique approach to the study of rehabilitation problems. First, through its focus on biomedical engineering, the Center studies how the nervous and skeletal muscle systems of the human body normally work. Secondly, through its rehabilitation science and technology components, it models the mechanisms by which these systems become impaired through disease or injury. Within its rehabilitation technology aspects, the Center investigates how technology can help to restore or replace functions such as hearing, speaking, seeing or moving through the use of artificial assistive or substitutive devices. Through a clinical link with Clarkson’s Physical Therapy 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 (CIteR)

Stephanie Schuckers
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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 of Arizona, University at Buffalo, and Michigan State University. CIteR focuses on biometrics, identity, and human analytics (www.clarkson.edu/citer). Over 20 affiliates, including the FBI, DOD, DHS, Qualcomm, Northrop Grumman, 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:

- Human sensing and acquisition
- Feature extraction and processing
- Machine learning and analytics
- Performance and modeling
- Multispectral and cross spectral imaging
- Novel modalities
- Mobile & computing
- Social signal processing
- Authentication & cybersecurity
- Behavioral and soft biometrics
- 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,
Center for Metamaterials

David Crouse, Professor / Chair of Electrical & Computer Engineering  
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The Center for Metamaterials is an NSF-sponsored Industry/University Cooperative Research Center. We provide a forum for cooperative research on the development and application of metamaterials. Metamaterials are patterned and/or composite materials that exhibit effective permittivity, permeability or refractive index properties not found in nature. These are commonly the result of resonant phenomena arising from the subwavelength-scaled elements forming those patterns or composites. The smaller these elements or meta-atoms, with respect to the wavelength of the electromagnetic radiation, the better the metamaterial satisfies effective medium criteria and can be treated as a genuinely new material. Such materials have the potential to provide index values that are very large, less than unity or negative, all of which have broad applications.

The Center’s mission is to provide a collaborative multi-university facility to research, design, fabricate and test a wide range of metamaterials. There is strong industry interest in metamaterials, as they 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 development. The projects advance knowledge through precompetitive research that will directly benefit Center members through shared knowledge and intellectual property. The intent is to nurture long-term relationships and collaborations among the universities, companies and organizations that are participating in the Center.

Center for Complex Systems Science

Erik Bollt, Director of the Clarkson Center for Complex Systems Science  
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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 individual elements alone. Mathematical tools for complex systems science are drawn from the following fields:

- **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.

- **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.

- **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 the 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.

- **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.

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 automata, information theory, activated processes including glasses, fractals, scaling and renormalization.

**Center for Electric Power System Research**

*Thomas Ortmeyer, Director*

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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. While historically centered in the Electrical and Computer Engineering Department at Clarkson, the interest in electric power systems has grown across campus, and active research is being conducted throughout the university. 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 also has a strong education mission, at the undergraduate and graduate levels, as well as in programs for practicing professionals.

**Shipley Center for Innovation**  
*Matthew Draper, Executive Director*  
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*Jamey Hoose, Director*  
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The Shipley Center for Innovation is a University-wide resource dedicated to bringing Clarkson innovations to market, gaining recognition for the technology created by our faculty and students, and creating local jobs for graduating Clarkson students. The Center will serve as an engine for economic development in the North Country by engaging in the creation of new enterprises that capitalize on emerging technologies.  
The Shipley Center for Innovation is comprised of a business incubator that provides tools needed for the emerging technologies to be commercialized and developed into profitable companies. Workshops are also developed to assist with future technology.

**Center for Sustainable Energy Systems**  
*Kenneth Visser, Director*  
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Clarkson University has been engaged in energy research and education for over 40 years and our faculty's wide range of interests and activities span disciplines from Engineering to Business. Specific current areas of research include wind turbine design, power engineering, bioenergy, behavioral change for energy conservation, public perception and adoption of green energy technologies and energy education. The Center provides a vehicle to bring these efforts together, exchange ideas with each other and generate new concepts for innovative, sustainable, collaborative projects at local, national and international levels. The Center also supports the current efforts of the Institute for a Sustainable Environment (ISE) and the Center for Advanced Materials Processing (CAMP) and is closely linked to the Shipley Center for Innovation.

**Great Rivers Center**  
*Michael Twiss, Director*  
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Clarkson University faculty and researchers have a distinguished history of investigating and engineering solutions to a broad range of issues involving the lower Great Lakes and St. Lawrence River. Clarkson is best known for contributing to the solution of environmental problems such as eutrophication, toxic chemical pollution, and corrective measures to remediate contaminated environments; to the solution of water resources management concerns related to navigability for...
commerce and power generation, especially as affected by winter conditions and the formation and
dynamics of ice; and for addressing socioeconomic issues such as binational trade and cultural
concerns.

These activities have been undertaken by teams comprising faculty members, graduate students and
undergraduates using Clarkson facilities and often involving collaborators from several other
universities in New York State via the Great Lakes Research Consortium. Not only do these efforts
create new knowledge that is essential to the education of students who pursue BS, MS, ME and PhD
degrees and to the professional development of the faculty members, this work provides
environmental and economic benefits to the people of the region, the nation and, indeed, the
international community.

Recognizing the multiplicative effect of interdisciplinary collaboration, in 1999 Clarkson initiated
actions that resulted in the establishment of the Great Rivers Center on the Clarkson campus. The
Great Rivers Center is integrated into the education, research and outreach missions of the Clarkson
Institute for a Sustainable Environment.
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B.A., University of Michigan  
PhD, Michigan State University  
Associate Professor of Consumer and Organizational Studies

WILKE, Andreas  
M.A., PhD, Free University of Berlin, Germany  
Associate Professor/Chair of Psychology

WOJTKEWICZ, Steven  
BS, MS, PhD, University of Illinois at Urbana-Champaign  
Associate Professor of Civil & Environmental Engineering

XYDIAS, Christina  
B.A., Brown University  
M.A., PhD, Ohio State University  
Associate Professor of Political Science

YU, Zhenxin  
BE, Xi’an Jiao tong University, China  
PhD, Hong Kong Polytechnic University  
MS, PhD Washington University in St. Louis  
Associate Professor of Operations and Information Systems

YURGARTIS, Steven  
BS, Clarkson University  
MS, Stanford University  
PhD, Rensselaer Polytechnic Institute  
Associate Professor of Mechanical and Aeronautical Engineering

YUYA, Philip  
BS, MS, PhD University of Nairobi, Kenya  
Associate Professor of Mechanical and Aeronautical Engineering

ZEBEDEE, Allan  
B.A., Colby College  
M.A., PhD, University of California at San Diego  
Associate Professor of Economics and Financial Studies

ASSISTANT PROFESSORS

ANDRIANO, Joseph  
Assistant Professor of Economics and Financial Studies

ANDREESCU, Daniel  
BS, University of Bucharest, Romania  
MS, University of Bucharest, Romania  
PhD, University of Bucharest, Romania  
Assistant Professor of Chemistry and Biomolecular Science

ARACHCHI, D. Kumudu  
Visiting Assistant Professor of Mathematics

ATHAVALE, Prashant  
BE, University of Mumbai  
MS, University of Toledo  
MS, PhD, University of Maryland  
Assistant Professor of Mathematics

BAILEY, Susan  
BS, McMaster University  
MS, University of Calgary  
PhD, University of Ottawa  
Assistant Professor of Biology

Baki, Abul  
B.Sc. BUET, Dhaka, Bangladesh  
M.Sc., BUET, Dhaka Bangladesh  
Ph.D. University of Alberta, Edmonton, AB  
Assistant Professor in Civil and Environmental Engineering

BALL, Jennifer  
B.A., Saint Vincent College  
M.A., PhD, Purdue University  
Assistant Professor of History

BANAVAR, Mahesh Krishna  
BE, Visvesvaraya Technological University  
MS, PhD, Arizona State University
Assistant Professor of Electrical and Computer Engineering
BANERJEE, Natasha
BS, MS, Rochester Institute of Technology
PhD, Carnegie Mellon University
Assistant Professor of Computer Science

BANERJEE, Sanjib
BS, MS, PhD, West Virginia University
Assistant Professor of Computer Science

BEHNIA, Behzad
Assistant Professor Civil and Environmental Engineering

BOOLEAN, Ali
B.A., Tulane University, New Orleans, LA
M.A., Tulane University, New Orleans, LA
M.Ed., University of New Orleans, LA
Ph.D, Oklahoma State University
Post-doctoral, University of Georgia, Athens, GA
Assistant Professor of Physical Therapy

Brown, Ryan
B.A., Kenyon College, Gambier, OH
M.S., University of Chicago, IL
PhD, University of Chicago, IL

BUDISIC, Marko
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PhD, University of California, Santa Barbara
Assistant Professor of Mathematics

CHO, Na-Eun
BS, University of Washington
MBA, Yonsei University
Ph.D, University of Michigan
Assistant Professor Consumer & Organizational Studies

CIANI, Mario
BS, SUNY University of Albany
MS, University of Bridgeport
D.C., New York Chiropractic College
Assistant Professor of Occupational Therapy

DAVID, Andrew
BS, St. Johns University
MS, Hofstra University
PhD, Stellenbosch University
Assistant Professor of Biology

DAVIS, Allen
BS, Springfield College
Assistant Professor of Military Science

DU, Yuncheng
Assistant Professor Chemical & Biomolecular Engineering

ERATH, Byron
BS, Brigham Young University
MS, Purdue University
PhD, Purdue University
Assistant Professor of Mechanical and Aeronautical Engineering

FRAZIER, Camille
BA, Scipps College
MA, PhD, University of California
Assistant Professor of Anthropology

HAUSER, Brian
B.A., M.A., PhD, Ohio State University
Assistant Professor of Film

HE, Ying
B.A. Wuhan University
MS Bowling Green State University
PhD University of Florida
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HOFFMANN, Claudia
B.A., University of Hamburg
M.A., Purdue University
PhD, University of Florida
Assistant Professor of Film

HONGAY, Cintia
BS, Suffolk University
PhD, Harvard University
Assistant Professor of Biology

Hunter, Ginger
BS, University of Virginia
PhD, Duke University
Assistant Professor of Biology

HUSSAIN, Faraz
BE, Birla Institute of Technology & Science
MS, Iowa State University
PhD, University of Central Florida
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JOYCE, Terri
BS, Hahnemann University
M.P.A.S., University of Nebraska Medical Center
Clinical Assistant Professor of Physician Assistant Studies
Ph.D, University of Ottawa, Canada
Ph.D, Istanbul Technical University
Assistant Professor of Electrical and Computer Engineering

KHOSHNEVISAN, Sara
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Kim, Taeyoung
Assistant Professor of Chemical and Biomolecular Engineering / Institute for a Sustainable Environment

KNACK, Ian
BS, Clarkson University, Potsdam
MS, Clarkson University, Potsdam
PhD, Clarkson University, Potsdam
Assistant Professor of Civil and Environmental Engineering

KRAUS, Petra
Assistant Professor of Biology
PhD University of Ulm, Germany (Molecular Genetics & Human Biology)

KRING, Stefanie
BS, SUNY Potsdam
BS, MS, PhD, Clarkson University
Assistant Professor of Biology

LAFAY, Vicki
BS, Ithaca College
DPT, SUNY Upstate Medical University

Director of Clinical Education /Clinical Assistant Professor of Physical Therapy/Interim Associate Chair

LI, Jie
BS, XI’AN JIAOTONG University, China
MS, XI’AN JIAOTONG University, China
Ph.D, Illinois Institute of Technology, Chicago, IL
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LIN, Jr-Shiuan
BS, PhD, National Taiwan University
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LIU, Chenchen
BE, Shaanxi University of Science & Technology ME, Peking University
PhD, University of Pittsburgh
Assistant Professor of Electrical and Computer Engineering

Liu, Yu
Assistant Professor of Electrical and Computer Engineering

LIU, Chen
BS, MS, Tongji University
PhD, Vanderbilt University
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LIU, Yaoqing
BS, Dalian Maritime University, China
MS, PhD, University of Memphis
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Lu, Xiaocun
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PhD, The University of Akron, OH
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MACKEY, Ty
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MBA, Brigham Young University
BS, Brigham Young University
Assistant Professor of Consumer and Organizational Studies
MACKINNON, William  
B.P.S., MS, Clarkson University  
PhD, Carleton University  
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MANIERRE, Matt  
B.A., Eastern Connecticut State University  
M.A., University of Delaware, 2012  
Ph.D, University of Delaware, 2016  
Assistant Professor of Sociology

MARKO, Moshe  
BPT, University of Tel-Aviv, Israel  
MHS, Washington University  
DPT, Massachusetts General Hospital Institute of Health Professions  
PhD, Syracuse University  
Assistant Professor of Physical Therapy

MARQUEZ-ILLESCAS, Gilberto  
B.Sc., Universidad de las Americas-Puebla  
M.A., Universidad Carlos III de Madrid  
Msc., Universidad Carlos III de Madrid  
PhD, Universidad Carlos III de Madrid  
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MARTIN, Jonathan  
BSc, Memorial University of Newfoundland  
PhD, University of Alberta  
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MARTIN, Rebecca  
BS, Misericordia University, Dallas, PA  
MS, Misericordia University, Dallas, PA  
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MARTINEZ LEON, Hilda  
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D.Sc. Tecnologico de Monterrey  
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MASTORAKOS, Ioannis  
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Director of the Writing Center

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David D. Reh School of Business

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M.A., SUNY Potsdam
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MS C.W. Post College
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STRANG, Carl
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Information Systems

SZARKA, Andrew
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Humanities & Social Sciences

TIGHE, Michael
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TITUS, Leo
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Engineering

TIRION, Monique
Adjunct Research Associate Professor

WELLS, David John
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PE Wyoming (active)
Dean Emeritus – SUNY Canton
Adjunct Professor, MAE Department

WIGGINS, Arderrick
Instructor of Military Science

WULTSCH, Elisabeth
Instructor of School of Engineering
# ACADEMIC CALENDARS

## Semester Programs

<table>
<thead>
<tr>
<th>Fall Semester Events</th>
<th>2018-2019</th>
<th>2019-2020</th>
<th>2020-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Residential Business Program Classes Begin</td>
<td>20 Aug M</td>
<td>26 Aug M</td>
<td>24 Aug M</td>
</tr>
<tr>
<td>New Transfer Student Check-in</td>
<td>23 Aug TH</td>
<td>29 Aug TH</td>
<td>27 Aug TH</td>
</tr>
<tr>
<td>New First Year Student Check-In</td>
<td>24 Aug F</td>
<td>30 Aug F</td>
<td>28 Aug F</td>
</tr>
<tr>
<td>Returning Student Check-In</td>
<td>26 Aug SU</td>
<td>1 Sept SU</td>
<td>30 Aug SU</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>27 Aug M</td>
<td>2 Sept M</td>
<td>31 Aug M</td>
</tr>
<tr>
<td>Fall Recess Begins*</td>
<td>5 Oct F</td>
<td>11 Oct F</td>
<td>9 Oct F</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>10 Oct W</td>
<td>16 Oct W</td>
<td>14 Oct W</td>
</tr>
<tr>
<td>Family Weekend Begins</td>
<td>19 Oct F</td>
<td>18 Oct F</td>
<td>TBD</td>
</tr>
<tr>
<td>Midterm Grades Due at Noon</td>
<td>24 Oct W</td>
<td>30 Oct W</td>
<td>28 Oct W</td>
</tr>
<tr>
<td>Enrollment For Spring Classes Begin</td>
<td>7 Nov W</td>
<td>13 Nov W</td>
<td>11 Nov W</td>
</tr>
<tr>
<td>Thanksgiving Recess Begins*</td>
<td>20 Nov TU</td>
<td>26 Nov TU</td>
<td>24 Nov TU</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>26 Nov M</td>
<td>2 Dec M</td>
<td>30 Nov M</td>
</tr>
<tr>
<td>Last Day of Class</td>
<td>7 Dec F</td>
<td>13 Dec F</td>
<td>11 Dec M</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>10 Dec M</td>
<td>16 Dec M</td>
<td>14 Dec M</td>
</tr>
<tr>
<td>Exams End</td>
<td>14 Dec F</td>
<td>20 Dec F</td>
<td>18 Dec F</td>
</tr>
<tr>
<td>December Graduates Recognition Ceremony</td>
<td>15 Dec SA</td>
<td>14 Dec SA</td>
<td>TBD</td>
</tr>
<tr>
<td>Final Grades Due at Noon</td>
<td>17 Dec M</td>
<td>23 Dec M</td>
<td>21 Dec M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Semester Events</th>
<th>Spring 2019</th>
<th>Spring 2020</th>
<th>Spring 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Residential MBA and Graduate Health Science Classes Begin</td>
<td>7 Jan M</td>
<td>13 Jan M</td>
<td>11 Jan M</td>
</tr>
<tr>
<td>New Student Check-In</td>
<td>8 Jan TU</td>
<td>12 Jan TU</td>
<td>12 Jan TU</td>
</tr>
<tr>
<td>Returning Student Check-In</td>
<td>9 Jan W</td>
<td>13 Jan W</td>
<td>13 Jan W</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>10 Jan TH</td>
<td>16 Jan TH</td>
<td>14 Jan TH</td>
</tr>
<tr>
<td>February Break Begins*</td>
<td>20 Feb W</td>
<td>19 Feb W</td>
<td>17 Feb W</td>
</tr>
<tr>
<td>Classes Resume</td>
<td>25 Feb M</td>
<td>24 Feb M</td>
<td>22 Feb M</td>
</tr>
<tr>
<td>Graduate Residential Business Program Spring Recess Begins*</td>
<td>8 Mar F</td>
<td>13 Mar F</td>
<td>TBD</td>
</tr>
</tbody>
</table>

<p>| Spring Recess Begins*                                    | 15 Mar F    | 23 Mar F    | 12 Mar F    |
| Midterm Grades Due to SAS — Noon                        | 11 Mar M    | 23 Mar M    | 22 Mar M    |
| All Classes Resume                                       | 25 Mar M    | 25 Mar M    | 22 Mar M    |</p>
<table>
<thead>
<tr>
<th>Event</th>
<th>Summer 2019</th>
<th>Summer 2020</th>
<th>Summer 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment For Fall Classes Begin</td>
<td>3 Apr W</td>
<td>8 Apr W</td>
<td>7 Apr W</td>
</tr>
<tr>
<td>Last Day of Class</td>
<td>26 Apr F</td>
<td>1 May F</td>
<td>30 Apr F</td>
</tr>
<tr>
<td>Reading Days</td>
<td>29-30 Apr M, TU</td>
<td>4-5 May M, TU</td>
<td>3-4 May M, TU</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>1 May W</td>
<td>6 May W</td>
<td>5 May W</td>
</tr>
<tr>
<td>Exams End</td>
<td>7 May TU</td>
<td>12 May TU</td>
<td>11 May TU</td>
</tr>
<tr>
<td>Final Grades Due at Noon</td>
<td>10 May F</td>
<td>15 May F</td>
<td>14 May F</td>
</tr>
<tr>
<td>Graduate Commencement Ceremony</td>
<td>9 May TH</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Undergraduate Commencement Ceremony</td>
<td>11 May SA</td>
<td>16 May SA</td>
<td>15 May SA</td>
</tr>
</tbody>
</table>

### Summer Sessions

<table>
<thead>
<tr>
<th>Session</th>
<th>Summer 2019</th>
<th>Summer 2020</th>
<th>Summer 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer 15 Week Trimester Session Begins</td>
<td>13 May M</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Summer 10 Week Session Begins</td>
<td>20 May M</td>
<td>25 May M</td>
<td>24 May M</td>
</tr>
<tr>
<td>Session 1 Begins</td>
<td>20 May M</td>
<td>25 May M</td>
<td>24 May M</td>
</tr>
<tr>
<td>Summer MAT Session Begins</td>
<td>24 Jun M</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Session 1 Ends</td>
<td>22 Jun SA</td>
<td>27 Jun SA</td>
<td>26 Jun SA</td>
</tr>
<tr>
<td>Session 2 Begins</td>
<td>1 Jul M</td>
<td>6 Jul M</td>
<td>5 Jul M</td>
</tr>
<tr>
<td>Session 2 Ends</td>
<td>3 Aug SA</td>
<td>8 Aug SA</td>
<td>7 Aug SA</td>
</tr>
<tr>
<td>Summer 10 Week Session Ends</td>
<td>3 Aug SA</td>
<td>8 Aug SA</td>
<td>7 Aug SA</td>
</tr>
<tr>
<td>Summer MAT Session Ends</td>
<td>3 Aug SA</td>
<td>8 Aug SA</td>
<td>7 Aug SA</td>
</tr>
<tr>
<td>Summer 15 Week Trimester Session Ends</td>
<td>30 Aug F</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

### Alumni Reunion Dates

- 7/11-7/14
- 7/9-7/12
- 7/8-7/11

### Quarter Programs

#### 2018-2019

<table>
<thead>
<tr>
<th>Event</th>
<th>Fall 2018</th>
<th>Fall 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes begin</td>
<td>5 Sept W</td>
<td>11 Sept W</td>
</tr>
<tr>
<td>Check-in deadline</td>
<td>10 Sept M</td>
<td>16 Sept M</td>
</tr>
<tr>
<td>Enrollment for Winter classes begins</td>
<td>12 Oct F</td>
<td>18 Oct F</td>
</tr>
<tr>
<td>Classes end</td>
<td>13 Nov T</td>
<td>19 Nov T</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>14 Nov W</td>
<td>20 Nov W</td>
</tr>
<tr>
<td>Exams End</td>
<td>20 Nov T</td>
<td>26 Nov T</td>
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<tr>
<td>Final grades due to SAS by 12:00 noon</td>
<td>26 Nov M</td>
<td>2 Dec M</td>
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<tr>
<td>December graduates recognition ceremony</td>
<td>15 Dec SA</td>
<td>14 Dec SA</td>
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### Winter Quarter Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Winter 2019</th>
<th>Winter 2020</th>
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<tbody>
<tr>
<td>Classes begin</td>
<td>7 Jan M</td>
<td>6 Jan M</td>
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<tr>
<td>Check-in deadline</td>
<td>10 Jan TH</td>
<td>9 Jan TH</td>
</tr>
<tr>
<td>Enrollment for Spring classes begins</td>
<td>15 Feb F</td>
<td>14 Feb F</td>
</tr>
<tr>
<td>Classes end</td>
<td>15 Mar F</td>
<td>13 Mar F</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>18 Mar M</td>
<td>16 Mar M</td>
</tr>
<tr>
<td>Exams End</td>
<td>22 Mar F</td>
<td>20 Mar F</td>
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<tr>
<td>Final grades due to SAS by 12:00 noon</td>
<td>27 Mar W</td>
<td>25 Mar W</td>
</tr>
<tr>
<td>Commencement</td>
<td>14 Jun F</td>
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### Spring Quarter Events

<table>
<thead>
<tr>
<th>Event</th>
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<tr>
<td>Classes begin</td>
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<td>30 Mar M</td>
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<tr>
<td>Check-in deadline</td>
<td>4 Apr TH</td>
<td>2 Apr TH</td>
</tr>
<tr>
<td>Enrollment for Summer classes begins</td>
<td>10 May F</td>
<td>8 May F</td>
</tr>
<tr>
<td>Classes end</td>
<td>7 Jun F</td>
<td>5 Jun F</td>
</tr>
<tr>
<td>Exams Begin</td>
<td>10 Jun M</td>
<td>8 Jun M</td>
</tr>
<tr>
<td>Exams End</td>
<td>14 Jun F</td>
<td>12 Jun F</td>
</tr>
<tr>
<td>Final grades due to SAS by 12:00 noon</td>
<td>19 Jun W</td>
<td>17 Jun W</td>
</tr>
<tr>
<td>Commencement</td>
<td>14 Jun F</td>
<td>TBD</td>
</tr>
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### Summer Quarter Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Summer 2019</th>
<th>Summer 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes Begin</td>
<td>17 Jun M</td>
<td>15 Jun M</td>
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<tr>
<td>Check-in Deadline</td>
<td>20 Jun TH</td>
<td>18 Jun TH</td>
</tr>
<tr>
<td>Enrollment for Winter Begins</td>
<td>26 Jul F</td>
<td>24 Jul F</td>
</tr>
<tr>
<td>Last Day of Class</td>
<td>23 Aug F</td>
<td>21 Aug F</td>
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<tr>
<td>Exams Begin</td>
<td>26 Aug M</td>
<td>24 Aug M</td>
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<tr>
<td>Exams End</td>
<td>30 Aug F</td>
<td>28 Aug F</td>
</tr>
<tr>
<td>Final Grades Due to SAS 12:00 noon</td>
<td>4 Sept W</td>
<td>2 Sept W</td>
</tr>
</tbody>
</table>

*Contact hours for class days that fall on a holiday will be made up as determined by the course instructor*
POLICIES

Non-Discrimination Policy
Clarkson University does not discriminate on the basis of race, color, religion, sexual orientation, gender identity, gender expression, national or ethnic origin, age, disability, veteran status, predisposing genetic characteristics, domestic violence victim status, marital status, parental status, ancestry, source of income, or other classes protected by law in provision of educational opportunity, or employment opportunities. Clarkson University does not discriminate on the basis of sex or disability in its educational programs and activities, pursuant to the requirements of Title IX of the Educational Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, and the American Disabilities Act of 1990 respectively. This policy extends to both employment by and admission to the University.

Inquiries concerning Section 504, and the Americans with Disabilities Act of 1990, should be directed to ADA504@clarkson.edu.

Inquiries concerning Title IX, the Age Discrimination Act, or other discrimination concerns should be directed to the Chief Inclusion & Human Resources Officer/Affirmative Action Officer at (315) 268-6497, Room 104 Graham Hall, Clarkson University, Box 5542, Potsdam, NY 13699-5542 and/or the Title IX Coordinator, Room 124 Snell Hall, Clarkson University, Box 5750, Potsdam, NY 13699-5750; or telephone 315-268-4208.

Information on the processing of grievances and charges relating to the above policies can be obtained from the Human Resources Office/Affirmative Action Office.

Clarkson University is making a special effort to identify for employment opportunities and participating in its educational programs a broad spectrum of candidates, including women, minorities, and people with disabilities.

Student Complaint Process (HEOA)
In compliance with the Higher Education Opportunity Act of 2008 and the state complaint processes as prescribed for under 34 CFR 600.9, the following resources are provided:

Filing a Grievance with NY State
New York State Education Department
Office of College and University Evaluation
EBA Room 969
89 Washington Avenue
Albany, New York 12234

Filing a Grievance with Appropriate State Education Departments/Agencies/Officials - All States

Campus Crime Statistics
The Advisory Committee on Campus Safety will provide upon request all campus crime statistics as reported to the United States Department of Education. Contact the Director of Campus Safety & Security, 315-268-6666, or visit www.clarkson.edu/campussafety
Protection of Privacy
Clarkson University abides by the provisions of the Family Educational Rights and Privacy Act of 1974 (Buckley Amendment). The University will release or withhold information under these provisions, which are published annually in the Clarkson Regulations.

Nonimmigrant Alien Students
Clarkson is authorized under federal law to enroll nonimmigrant alien students.
LIST OF GRADUATE PROGRAMS/CERTIFICATES & 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.

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<thead>
<tr>
<th>Program</th>
<th>Degree(s)</th>
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<tr>
<td>Adolescence Education 7-12</td>
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<tr>
<td>Basic Science</td>
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<td>4902</td>
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<td>Bioethics (Interdisciplinary)</td>
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<tr>
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