Mechanical & Aeronautical engineering

Student Handbook

Clarkson UNIVERSITY

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Wallace H. Coulter School of Engineering

Mechanical and Aeronautical Engineering Dept.

UG Student Handbook

2018-2019

Contents

1.0 Introduction

You will find herein information about the academic advisors, the curriculum, Clarkson services, special programs, and advice about career planning. If the information you need is not in this document, or if you require more detailed information, consult the references listed at the end. If these sources lack the answer you are looking for, see your advisor.

This handbook will be revised periodically to keep pace with changes in the Department. Curricular requirements may change between revisions. Thus the handbook may not always contain the completely current curricular information. Therefore, the curricular information herein does not generally guarantee that a particular course will be taught.

2.0 Being a Student

2.1 Introduction

You may have already heard from friends, family members, or guidance counselors that you will experience a different form of education when you enter college; it is not like high school. Now, that doesn't imply that you should be apprehensive about college, but it does imply that you should keep your eyes open to the new environment and learn to adjust.

2.2 Self-reliance

During the next four years you will find yourself gaining more and more self-reliance. But self-reliance doesn't mean that you have to do everything yourself; it does mean that you ask for help when you need it and stand on your own feet when you don't. Developing self-reliance should be one of your goals in college.

2.3 Professionalism

One adjustment to college is to think of yourself as a student-professional; a student who will soon be a professional engineer. Like any professional position, there are certain expectations that you must fulfill. The best way to meet these expectations is to keep on top of things; don't let yourself fall behind. Also, go to classes prepared; have all your work and reading done, and have questions ready. Participate in the discussions, practice the problems the professors assign, and push yourself to do your best. You are building the base for your professional career; build a strong base.

The professors do not cover everything that you must know in class; they expect that you will study beyond the lecture. You will find that the professors are more like guides, and you have to play the teacher as well as the student more than you had to in high school. By forcing you to play a stronger role in your education, they are preparing you for the professional world where there are no obvious teachers.

In your senior year you will participate in a two-semester, capstone design course. In this course you will collaborate with other students in a project team. Working in this way is typical of professional life. Learn well how to do it.

Near the end of each semester each professor will give you a "course evaluation form" to fill out. The comments you make regarding the course and the professor are taken seriously. The professors' salaries, tenure, and promotion are influenced by the information on this form, and it is important that you are objective and professional in filling out these forms.

3.0 Advisors

3.1 Introduction

Each student has been assigned an academic faculty advisor from the MAE Department. The advisor-advisee lists with a picture of each MAE faculty member are displayed in the Center for Advanced Materials Processing (CAMP) adjacent to Room 253.

You may wish to change your advisor, perhaps because you have developed career interests that overlap those of another member of the MAE faculty, or for other reasons. To make a change, go to the Mechanical and Aeronautical Engineering Department office in room 253 CAMP. Request a new advisor from the secretary there. There is no need to inform your original advisor.

3.2 Advisor - Student Relationship

Visit your advisor as often as you need and do it more frequently than once a semester. This will make the advising process easier and more productive. For example, your advisor will be able to write more effective employment or other recommendations for you. So, contact your advisor and schedule a meeting.

3.3 What is the Advisor's Responsibility?

The advisor's help may include career advice or help in choosing courses. Advisors will meet with each of their advisees during the course selection period. They prepare for these meetings by knowing the curriculum well. That means knowing substitute courses, course options available, and the best course for a certain area of interest. Finally, the advisor must know you, the student. Knowing your goals and interests will help them to suggest courses that suit you. After discussing your curriculum, the advisor will sign your Course Enrollment Worksheet and release your advisor hold on PeopleSoft. Advisors usually establish special office hours for course selection week and post signup sheets outside their offices.

3.4 What is the Student's Responsibility?

The student, not the advisor, is responsible for meeting Clarkson's graduation requirements. If you have not met the graduation requirements, you will not graduate, regardless of the advice you have received. Therefore, know the requirements and begin now to plan your Clarkson career. Then you can go into the course selection meeting with your choices for classes pre-selected. Details and problems can then be ironed out during your visit. Students should prepare for these meetings by reviewing their current transcript on the PeopleSoft database and printing a curriculum sheet for their class year from the MAE Website. Students should be aware of the courses they have taken and need to take.

Master Schedules of course offerings are available on the Student Administrative Services (SAS) Website https://www.clarkson.edu/student-administrative-services-sas prior to the course selection period.

4.0 Program Objectives and Outcomes

4.1 Introduction

This section describes the objectives, and the outcomes supporting those objectives, for the Mechanical Engineering (ME) and Aeronautical Engineering (AE) degree programs of the MAE Department.

4.2 Program Educational Objectives

There are three program objectives for both the AE and ME programs.

4.2.1 AE Program Objectives.

1. Graduates will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of aircraft and related systems and they will understand the social, ethical, and environmental context of their work.

2. Graduates will communicate clearly, collaborate competently in teams, and assume leadership roles.

3. Graduates will have the habit of continuous professional development.

4.2.2 ME Program Objectives.

1. Graduates will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of mechanical systems and they will understand the social, ethical, and environmental context of their work.

Objectives 2 and 3 are the same as in the AE program.

4.3 Student Outcomes

4.3.1 Introduction. The student outcomes are the generic abilities that graduates will demonstrate that they have acquired. Acquisition of competence in these abilities shows that a graduate has met the program educational objective that applies to her or his program. The defining characteristics of professional problems and the process used to solve them lead directly to these student outcomes. Although the generic abilities to be acquired are the same for the AE and ME degrees, the technical content of the programs of course differ, as section 4.2 implies.

The main goal of the undergraduate engineering education, is to learn to learn how to learn on your own and hence to recognize that the practice of engineering requires lifelong learning. "Competence," used to characterize the acceptable performance level of certain outcomes, means sufficient ability to perform the task, unaided by the instructor, at the level of the course. This "sufficient ability" rises to the entry professional level in the required, senior-year courses.

4.3.2 Outcomes List. The AE and ME curricula (discussed in Section 5.0) have been designed to support the program outcomes listed below, which are also expected by ABET:

a. *An ability to apply knowledge of mathematics, science, and engineering.*

b. *An ability to design and conduct experiments, as well as to analyze and interpret data.*

c. *An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.*

d. *An ability to function on multidisciplinary teams.*

e. *An ability to identify, formulate, and solve engineering problems.*

f. *An understanding of professional and ethical responsibility.*

g. *An ability to communicate effectively.*

h. *The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.*

i. *A recognition of the need for, and an ability to engage in life-long learning.*

j. *A knowledge of contemporary issues.*

k. *An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.*

4.3.3 <u>Professional Practice.</u> What is a typical problem of professional practice? A professional problem is vaguely defined compared to the information necessary to solve it. Its clarification depends, however, upon proposing solutions. Some of the requirements its solution must meet may be in conflict, therefore no solution can satisfy all of them. A solution will be complex, requiring utilization and synthesis of knowledge from several fields, or requiring the discovery of new knowledge. Hence, collaboration and study will be necessary. There will be a range of possible solutions, but no unique solution: these problems are "open-ended." This is their quintessential characteristic.

Another important part of engineering practice is to learn a better appreciation of the AE & ME programs with respect to the global issues that confront engineers today. There are professional societies on campus that relate to the fields of Mechanical and Aeronautical Engineering. These societies may give further information about what types of jobs are available and what kind of work is presently being done in the field. The societies and associated faculty advisors are:

American Institute of Aeronautics and Astronautics (AIAA) [Prof. K. Visser]
American Society of Mechanical Engineers (ASME) [Prof. A. Michalek]
Society of Automotive Engineers (SAE) [Prof. J. Moosbrugger]
Society of Women Engineers (SWE) [Prof. L. Kuxhaus]

The student chapters of these professional societies are very active sponsoring various events during the year including Open Houses, Parent's Weekend, several field trips, and a number of guest speakers. In addition, students have opportunities to participate in regional and national student conferences as well as leadership seminars. Various types of scholarships, awards, and loans are available through the local chapters of these societies. Student competitions are announced on a regular basis and students are always encouraged to participate in them. Contact the faculty advisors (listed in brackets above) or the presidents of the student chapters to get more information about these activities

An important part of student outcomes for both the AE & ME program is "an understanding of professional and ethical responsibility." The Aeronautical engineering society (AIAA), Mechanical engineering society (ASME) and the National Society of Professional Engineers (NSPE) societies have formulated and published codes of ethics. Because of the importance to the engineering community they are summarized below as published by the professional societies.

AIAA Code of Ethics

PRECEPT

The AIAA member to uphold and advance the honor and dignity of the aerospace profession and in keeping with high standards of ethical conduct:

I. Will be honest and impartial, and will serve with devotion his employer and the public;
II. Will strive to increase the competence and prestige of the aerospace profession;
III. Will use his knowledge and skill for the advancement of human welfare

ASME Code of Ethics of Engineers

The Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

I. using their knowledge and skill for the enhancement of human welfare;

II. being honest and impartial, and serving with fidelity their clients (including their employers) and the public; and

III. striving to increase the competence and prestige of the engineering profession.

NSPE Code of Ethics of Engineers

Preamble
Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons
Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

5.0 Curricula

5.1 Introduction

The instruction and experience built into the AE and ME curricula are the means by which students acquire competence in the abilities described by the program outcomes. Course descriptions may be found at the SAS Website: https://www.clarkson.edu/student-administrative-services-sas.

5.2 Standard AE and ME Requirements

5.2.1 AE and ME Curricula. To graduate, a student must accumulate at least 120 credit hours (cr.) and have a minimum cumulative total grade point average of 2.000. The credits are distributed for each degree program and graduation year as follows: Tables 5.1a and 5.1b show the standard AE curriculum for the class of 2015 and later. Tables 5.2a and 5.2b show the standard ME curriculum for the class of 2015 and later.

5.2.2 Mathematics Requirement. The required mathematics course sequence consists of MA131, MA132, MA232, MA231 and MA330, with the exception that the combination of MA331 and STAT383 can substitute for MA330.

5.2.3 Common Experience Curriculum. The Clarkson Common Experience provides a common set of learning expectations and outcomes for all Clarkson students. To achieve these outcomes, each student is required to complete a set of courses consisting of required and elective courses both from within the student's major field and from across the spectrum of all disciplines in the university.

Knowledge Area (KA) Courses. Students must achieve learning outcomes in six broad areas of knowledge listed below. The knowledge area requirement is met by completing five three credit courses including at least one University Course that unites two or more of the areas of knowledge. Together, these courses must cover at least four (4) of the six knowledge areas:

- Cultures and Societies - (CSO)
- Contemporary and Global Issues - (CGI)
- Imaginative Arts - (IA)
- Science, Technology, and Society (ES110 Required) - (STS)
- Individual and Group Behavior - (IG)
- Economics (EC350 or equivalent) - (EC)

One of the knowledge area electives must be an economics course (EC), with EC350 as the recommended course. One of the knowledge area electives must be a Science, Technology and Society course (STS), and ES110 is required. Note that BR200, EE268 and ES238 are acceptable substitutes for ES110.

University Course. All students must take at least one University course after the first year. University Courses will address learning outcomes in two or more of the six areas of knowledge. University courses are multidisciplinary, and students observe and participate in the interaction of disciplines.

Communication Points. Clarkson places a strong emphasis on developing students' abilities to communicate effectively in a variety of contexts using diverse forms of communication. Students must select coursework and possibly extracurricular activities that carry a total of at least six communication points. Courses and activities with a communication component will carry either one or two points. At least two points must come from within the student's major discipline in a 300/400 level course. ***All 6 communication points are covered in the Mechanical & Aeronautical Engineering curriculum.***

5.2.4 Professional I Elective (3 credits). Any 200 level or above Math, Science, Engineering, or Business courses.

5.2.5 Professional Electives – (AE 6 credits – ME 9 credits). The two AE-program professional electives and two of the three ME program electives may be MAE elective courses, courses offered by other engineering departments, or by the Mathematics, Computer Science, Physics, Chemistry or Biology departments, or by the School of Business, or a three-credit multi-disciplinary (MP) project course, as long as they meet requirements (1) – (4), below. The remaining ME program elective must be at least a 300-level AE, ES, or ME course.

1) They are of a technical nature such that they strengthen the engineering background of the student. The management courses that satisfy this requirement are listed: OM331 Operations/Production Management, OM476 Management of Technology, OM351 Quality Management and Lean Enterprise, and IS400 Development of Business Applications on the Internet.

2) They do not contain material which is a duplication of material covered in previously taken courses or which will be covered in a required course.

3) They are advanced level courses (300 or above).

4) They have received prior approval from the student's academic advisor. The fundamental criteria for approval shall be that the courses be consistent with the student's professional objective and academic program, and otherwise meeting the foregoing criteria.

Students are advised to complete a plan for their professional electives no later than the fall of their junior year.

Any exception to these policies governing professional electives must be approved in writing by the department Chair or Executive Officer.

5.2.6 Undesignated Electives (AE 3 credits, ME 6 credits). An undesignated elective may be any course which does not contain a significant amount of material already covered in a student's program. MPxxx, 3-credit courses may be used as undesignated electives. See the department to get an MPxxx course approved for meeting graduation requirements.

5.2.7 Freshman Seminar. Students should complete the Freshman Seminar course (FY100) during their freshman year, but in any case prior to graduation. This requirement will be waived for students who are granted at least 25 credits when they transfer to Clarkson.

5.2.8 Professional Experience Requirement ES499(05). The student is responsible for demonstrating to the program administration responsible for the student's major that the student has fulfilled the objectives of the out-of-class Professional Experience Requirement. This may include a co-op, internship, research or other professional experience. Students must document their activity/activities using the Departmental Approval and Completion Forms accessible through Handshake (https://clarkson.joinhandshake.com). Once the professional experience requirement is completed, the student will be given a permission number to enroll in ES499 (section 05) Professional Experience for engineering majors. This is a zero credit pass no entry course that is used to matriculate the professional experience requirement. Students need to have at least junior standing to enroll in this class.

5.2.9 Special Notes for Both Degrees

Replacement Courses. For students transferring to the MAE department, blanket exceptions have been granted for the courses shown below:

Internal Transfer Exceptions

ES100 with CS141, EM120 and 121
ES250 with EE322
ES330 with CH301
ES340 with ES448, CH271
AE/ME212 with CE212
ME411 with CH302
CM131 with CM103 and CM105
CM132 with CM104 and CM106

Replacement courses cannot be used to remove "F" grades.

Pass/ No Credit. The only courses in either the ME or the AE curriculum that can currently be taken on a pass or no credit basis are undesignated electives. Approval must be obtained using a form from Student Administrative Services (SAS). The SAS office will convert the instructor's letter grade to Pass (P). A grade of C or better will be considered passing. In the case of non-pass, the course will appear on your transcript with an NC (No Credit) notation. ROTC (Army and Air Force) students are not permitted to enroll in MS or AS courses on a pass or no-credit basis. Consult the Clarkson Regulations (https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations) for more information on pass or no credit entry:

Independent Study. Students may have a special interest within the field of Mechanical or Aeronautical Engineering that they would like to study. This can be done by arranging for a professor to advise the study and registering for one of the independent study course numbers (AE/ME365, AE/ME366, AE/ME367, AE/ME465, AE/ME466) using a special section number that the course advisor will give you. For more research oriented projects you can register for the ES courses in undergraduate research as level I, II, III, or IV.

AE/ME212. Engineering students transferring at least 54 credits from another institution who do not receive transfer credit for AE/ME212 may substitute an advanced design course for AE/ME212. The course substituted for AE/ME212 may not be used to satisfy other design requirements.

Retaking MA131 and PH 131. Freshmen students who receive a grade of D+ or D in MA131(Calculus I) or PH 131 (Fundamentals of Physics I) in the Fall semester should consider repeating these courses the following spring and should discuss this with their advisors. Note that MA 132 (MA131) is a co-requisite for PH132 (PH131). Thus PH 132 cannot be taken when repeating MA131, even if PH131 has been passed.

AE and ME Labs. The 200-level lab courses will be taken in the spring by sophomores, the 300- level courses in the fall by juniors, and the 400-level lab courses in the spring by juniors**.**

5.3 Minors, Concentrations

To complement and enrich their degree programs, students may complete course work in designated minor programs. Minors enable students to specialize in a separate and identifiable field outside their major. Minors require at least 15 hours of relevant course work, including at least 6 credit hours taken outside the student's major field. Completion of an approved minor will be entered on a student's transcript. AE and ME students find that completing a minor in mathematics is straightforward. Five courses on the list from which they may choose are part of the AE and ME Programs. The Catalog (https://www.clarkson.edu/node/9301) lists all available minors.

Students may also complete professional concentrations. These are areas of specialization within a major field. Professional concentrations require at least 15 credit hours of relevant course work. Completion of an approved professional concentration will be entered on a student's transcript. The Catalog lists the available professional concentrations.

5.4. Honors Program

For the University Honors Program (HP), the foundation computer requirement has been replaced with an Honors computer course and the "course in every school" requirement with a second year project course, Honors students have been placed in specially designed sections of

UNIV190, the Honors science seminar and the Honors thesis are used for the undesignated electives, and one professional elective, and two Liberal Arts seminars fill the six-credit KA requirements. The typical student will earn 25 credits in Honors classes.

Students who have been admitted to the program and are pursuing ME or AE majors should work with the Honors Program Director and the MAE department HP advisor (Professor Moosbrugger) on curriculum matters.

Table 5.3 shows how the Honors Program may be combined with the AE degree program and Table 5.4 shows how the Honors Program may be combined with the ME degree program. A student may elect to use her or his honors thesis (HP390…HP399 or HP490…HP491) to replace one or two professional electives in either the AE or the ME engineering program. However, to be accepted as meeting our graduation requirements the thesis must at least:

1. Meet the requirements for professional electives given in section 5.2.4;

2. Support program outcomes 1, 2, 3, and 6 given in section 4.3.2;

3. Be completed (including evaluation) no later than the end of the student's final semester at Clarkson;

4. Receive an evaluation mark equivalent to at least the minimum passing grade for undergraduates given in the Clarkson Regulations (https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations). (Note: a "P" received for an honor thesis is the equivalent of a 3.25.)

5. Students wishing to use an Honors Thesis as a professional elective must obtain the form from the MAE office and complete for approval for each of the 300- and 400-level Honors Thesis Courses they wish to use.

Students in the Mechanical Engineering (ME) program are required to have at least one professional elective that bears the "AE," "ES," or "ME" designator. The content of an Honors Thesis done for the ME program will, at minimum, be the equivalent to an ES-designated course; and therefore can be used to satisfy this restricted designator requirement.

Table 5.1a AERONAUTICAL ENGINEERING CURRICULUM

Class of 2022 and Above Updated 7/19/18

Student Name: **Student No:**

Advisor: **Class:**

A	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV190 Clarkson Seminar		(F)**	ES110 Engineering and Society(STS)(3cr) **or** KA Elective (3cr)		(F/S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II **or** (4cr) BY160 Biology II (3cr)		(S)
PH131 Fund of Physics I **or** (4cr) ES110 Engineering and Society(STS) (3cr)		(F/S)	PH131 Fund of Physics I **or** PH132 Fund of Physics II		(F/S) (F/S)
FYS (1cr)		(F)	ES100 Intro to Engr Use of Compu (2cr)		(S)
GPA= **CUM GPA =**		**STATUS =**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**SOPHOMORE**	**SPRING**	**GR**	**SOPHMORE**
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES260 Materials Science (TECH)		(F/S)	ES223 Rigid Body Dynamics		(S)
PH132 Fund of Physics II **or** ES250 Electrical Science		(F/S) (F/S)	ES250 Electrical Science **or** KA/UC Elective		(F/S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
AE212 Intro to Engineer Design		(F)	AE342 Intro to Numerical Methods		(F/S)
			AE201 Intro Exp Meth in AE (C2) (1cr)		(S)
GPA= **CUM GPA=**		**STATUS=**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**JUNIOR**	**SPRING**	**GR**	**JUNIOR**
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
KA/UC Elective			MA330* Advanced Eng Math		(F/S)
AE/ME455 Mech Vibrations & Control		(F)	AE401 Aero Eng. Lab III (1cr)		(S)
AE301 Exp Meth in AE (C2) (1cr)		(F)	Undesignated Elective		
			ES499 Professional Experience (0cr)		
GPA= **CUM GPA-=**		**STATUS=**	**GPA=** **CUM GPA=**		**Status=**
FALL	**GR**	**SENIOR**	**SPRING**	**GR**	**SENIOR**
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (TECH)		(S)
AE430 Stab Control of Aerospace Vehicles		(F)	AE427 Design of Propulsion Sys (C2)		(S)
AE/ME 431 Gas Dynamics		(F)	Professional Elective•		
Professional Elective•			KA/UC Elective		
Economics Elective					
GPA= **CUM GPA=**		**STATUS=**	**GPA=** **CUM GPA=**		**STATUS=**

Knowledge Areas*** and Comm. Pts. If any (Four Knowledge Areas Required)	University Course (One UC Course Required)	Professional Experience Paperwork:
CGI ☐ IA ☐ CSO ☐		☐ Pre-Approval Form
IG ☐ EC ☐ STS ☐	UC ☐ (Not to be taken by Freshman)	☐ Completion Form

*** or MA331 and STAT383. **Courses offered as follows: F-Fall, S-Spring, F/S – Fall and Spring**

******Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC), which covers two KA's. Note: Many KA's have communications Points (CP)=0. One of the knowledge area electives must be an economics course, EC350 is recommended.**

•Professional Elective – any 300 level technical course in Math, Science, Engineering or Business.

Table 5.1b AERONAUTICAL ENGINEERING AUDIT SHEET

Course No.	Course Title	CR.	Semester Offered	Pre-Requisites	Co-Requisites
UNIV190	Clarkson Seminar	3	F		
ES110	Eng. and Society (C1)(STS)	3	F/S		
CM131	Gen Chem I	4	F		
CM132	Gen Chem II	4	S	CM131	
PH131	Fund Physics I	4	F/S		MA131
PH132	Fund Physics II	4	F/S	PH131	MA132
MA131	Calculus I	3	F/S		
MA132	Calculus II	3	F/S	MA131	
MA231	Calculus III	3	F/S	MA132	
MA232	Elem Diff Equat	3	F/S	MA132	
MA330	Adv Engr Math	3	F/S	MA231, MA232	
ES100	Intr Engr Use Comp	2	S		
	FYS	1	F		
ES220	Statics	3	F/S	MA131, PH131	
ES222	Strength of Materials	3	F/S	ES220	
ES223	Rigid Body Dynamics	3	S	ES220, MA232	
ES250	Electrical Science	3	F/S		MA232, PH132
ES260	Materials Science (TECH)	3	F/S	PH131, CM131 and MA132	
ES330	Fluid Mechanics	3	F/S	MA232 or MA231 and ES220	
ES340	Thermodynamics	3	F/S	MA231, PH132	
AE212	Intro to Engr Design	3	S	ES100, ES220	
AE201	Exp. Method Aero (C2)	1	S		ES220, ES222,ES223 and ES250
AE301	Exp. Method Aero (C2)	1	F		ES330, ES340
AE401	Exp. Method Aero	1	S	AE/ME201 or AE/ME301	AE425 **or** AE455
AE342	Intro to Numerical Methods	3	F/S	ES100, MA232	ES222, MA 231
AE350	Aircraft Structures	3	F	ES222, ES223	
AE425	Aerodynamics	3	S	ES330, ES340, MA231	
AE427	Design of Propulsion Sys (C2)	3	S	ME326 **or** AE/ME431, ES340	
AE429	Aircraft Perf & Flight Mech	3	S		AE/ME425
AE430	Stab Cntrl of Aero Vehicles	3	F	AE/ME455, MA231 and MA232	
AE431	Gas Dynamics	3	F	ES330, ES340 and MA232	
AE450	Aircraft Design I (C1)	3	F	AE212,AE425,AE429 and AE458	AE430, AE431
AE451	Aircraft Design II (TECH)	3	S	AE450	AE427
AE455	Mech Vibrations & Control	3	F	ES223	
AE458	Design of Aircraft Structures	3	S	AE350	
	Economics Elective (EC)	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	Professional Elective	3			
	Professional Elective	3			
	Undesignated Elective	3			
ES499	Professional Experience	0		Consent of Instructor	
	Total Credits	121			

Table 5.2a MECHANICAL ENGINEERING CURRICULUM
Class of 2022 and Above –Updated 7/19/18

Student Name: **Student No:**
Advisor: **Class:**

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV190 Clarkson Seminar		(F)**	ES110 Engineering and Society (STS)(3cr) **or** KA Elective		(F/S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II **or** (4cr) BY160 Biology II (3cr)		(S)
PH131 Fund of Physics I **or** (4cr) ES110 Engineering and Society(STS) (3cr)		(F/S)	PH131 Fund of Physics I **or** PH132 Fund of Physics II		(F/S) (F/S)
FYS (1cr)		(F)	ES100 Intro to Engr Use of Computers		(S)
GPA= **CUM GPA=**		**STATUS =**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**SOPHOMORE**	**SPRING**	**GR**	**SOPHMORE**
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES260 Materials Science (TECH)		(F/S)	ES223 Rigid Body Dynamics		(S)
MA232 Elem Differential Equations		(F/S)	ME212 Intro to Engineer Design		(S)
PH132 Fund of Physics II **or** (4cr) ES250 Electrical Science		(F/S) (F/S)	MA231 Calculus III		(F/S)
KA/UC Elective		(F/S)	ES250 Electrical Science **or** KA Elective		
			ME201 Intro Exp Meth in ME (C2) (1cr)		(S)
GPA= **CUM GPA=**		**STATUS=**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**JUNIOR**	**SPRING**	**GR**	**JUNIOR**
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME342 Intro to Numerical Methods		(F/S)	ME455 Mech Vibrations & Control **or** ME310 Thermodynamics Sys Eng		(S) (F)
MA330* Advanced Eng Math		(F/S)	ME401 Adv Meth in ME (1cr)		(S)
KA Elective			Economics Elective		
ME301 Exp Meth in ME (C2) (1cr)		(F)	Professional I Elective•		
			ES499 Professional Experience (0cr)		
GPA= **CUM GPA=**		**STATUS=**	**GPA=** **CUM GPA=**		**Status=**
FALL	**GR**	**SENIOR**	**SPRING**	**GR**	**SENIOR**
ME324 Dynamical Systems		(F/S)	ME411 Heat Transfer		(F/S)
ME445 Integrated Design I (TECH)		(F/S)	ME446 Integrated Design II (C1)		(F/S)
AE-ES-ME Professional Elective			Professional Elective••		
Professional Elective••			Undesignated Elective		
Undesignated Elective					
GPA= **CUM GPA=**		**STATUS=**	**GAP=** **CUM GPA=**		**STATUS=**

Knowledge Areas*** and Comm. Pts. If any (Four Knowledge Areas Required)	University Course (One UC Course Required)	Professional Experience Paperwork:
CGI ☐ IA ☐ CSO ☐ IG ☐ EC ☐ STS ☐	UC ☐ (Not to be taken by Freshman)	☐ Pre-Approval Form ☐ Completion Form

***or MA331 and STAT383. **Courses offered as follows: F-Fall, S-Spring, F/S – Fall and Spring**

***** Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KA's.**

Note: Many KA's have communications Points (CP)=0. One of the knowledge area electives must be an economics course, EC350 is recommended.

•Professional I Elective – any 200 level or above Math, Science, Engineering or Business Course.

••Professional Elective – any 300 level technical course in Math, Science, Engineering or Business.

Table 5.2b MECHANICAL ENGINEERING AUDIT SHEET

Course No.	Course Title	CR.	Semester Offered	Pre-Requisite	Co Requisite
UNIV190	Clarkson Seminar	3	F		
ES110	Eng. and Society (C1)(STS)	3	F/S		
CM131	Gen Chem I	4	F		
CM132	Gen Chem II	4	S	CM131	
PH131	Fund Physics I	4	F/S		MA131
PH132	Fund Physics II	4	F/S	PH131	MA132
MA131	Calculus I	3	F/S		
MA132	Calculus II	3	F/S	MA131	
MA231	Calculus III	3	F/S	MA132	
MA232	Elem Diff Equat	3	F/S	MA132	
MA330	Adv Engr Math	3	F/S	MA231, MA232	
ES100	Intr Engr Use Comp	2	S		
FY100	First Year Seminar	1	F		
ES220	Statics	3	F/S	MA131, PH131	
ES222	Strength of Materials	3	F/S	ES220	
ES223	Rigid Body Dynamics	3	S	ES220, MA232	
ES250	Electrical Science	3	F/S		MA232, PH132
ES260	Materials Science (TECH)	3	F/S	PH131, CM131, MA132	
ES330	Fluid Mechanics	3	F/S	MA232 **or** MA231, ES220	
ES340	Thermodynamics	3	F/S	MA231, PH132	
ME212	Intro to Engr Design	3	S	ES100, ES220 and PH131	
ME201	Mech Eng Lab I (C2)	1	S		ES220, ES222, ES223 and ES250
ME301	Mech Eng Lab II (C2)	1	F		ES330, ES340
ME401	Mech Eng Lab III	1	S	AE/ME201 **or** AE/ME301	ME411 **or** ME326
ME310 **or** ME455	Thermodynamics Sys Engr. Mech Vibrations & Control	3 3	S F	ES340 ES223	
ME324	Dynamical Systems	3	F/S	MA232	
ME326	Interm Fluid Mechanics	3	F/S	ES330, ES340 and MA232	
ME341	Mech of Machine Elem	3	F/S	ES222	
ME342	Intro to Numerical Methods	3	F/S	ES100, MA232	ES220, MA231
ME411	Intro to Heat Transfer	3	F/S	ES330, ES340 and MA232	
ME445	Integrated Design I	3	F/S	ME212, ES330 and ES340	ME341
ME446	Integrated Design II (C1)	3	F/S	ME445	
	Economics Elective (EC)	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	Professional I Elective	3			
	AE-ES-ME Prof Elective	3			
	Professional Elective	3			
	Professional Elective	3			
	Undesignated Elective	3			
	Undesignated Elective	3			
ES499	Professional Experience	0			
	Total Credits	121			

Table 5.3 AERONAUTICAL ENGINEERING CURRICULUM
Class of 2022 and Above – Honors Program Updated 7/19/18

Student Name: **Student No:**
Advisor: **Class:**

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II **or** (4cr) BY160 Biology II (3cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II		(F/S)
HP100* Social & Ethical… I (3cr) HP102** Intro. To Programming I (1cr)		(F) Replaces UNIV 190	HP101 Social & Ethical… II (3cr) HP103** Intro. To Programming II (1cr)		(S) Replaces KA/UC Elective
FYS (1cr)		(F)			
GPA=	**CUM GPA =**	**STATUS =**	**GPA=**	**CUM GPA=**	**STATUS=**

FALL	GR	SOPHOMORE	SPRING	GR	SOPHMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(S)
ES260 Materials Science (TECH)		(F/S)	AE342 Intro to Numerical Methods		(F/S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
HP200 Soph. Project Course I		(F) Replaces KA/UC Elective	AE201 Intro Exp Meth in AE (C2) (1cr)		(S)
AE 212 Intro to Engineering Design		(F/S)	HP201 Soph. Project Course II		(S) Replaces KA Elective
GPA=	**CUM GPA=**	**STATUS=**	**GPA=**	**CUM GPA=**	**STATUS=**

FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
MA330*** Advanced Eng Math		(F/S)	AE401 Aero Eng. Lab III (1cr)		(S)
AE/ME455 Mech Vibrations & Control		(F)	HP390 Honors Thesis Proposal		(S)**** See Note
AE301 Exp Meth in AE (C2) (1cr)		(F)	**ES499 Professional Experience (0cr)**		
HP300 Junior Seminar: Ways of Knowing		(F) Replaces KA Elective			
GPA=	**CUM GPA-=**	**STATUS=**	**GPA=**	**CUM GPA=**	**Status=**

FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (TECH)		(S)
AE430 Stab Control of Aerospace Vehicles		(F)	Economics Elective		
AE/ME431 Gas Dynamics		(F)	AE427 Design of Propulsion Sys (C2)		(S)
HP490 Honors Thesis		(F)****See Note	HP400 Seminar on Modernity		(S) Replaces KA/UC Elective
GPA=	**CUM GPA=**	**STATUS=**	**GPA=**	**CUM GPA=**	**STATUS=**

*** Students who take HP 100 are exempt from taking ES110.**
****HP102 + HP103=ES100**
***** or MA331 and STAT383.**
******HP390 & HP490 may each serve as a Professional Elective: Appendix L approval required for each.**
Courses are offered as follows: F-Fall, S-Spring, F/S – Fall and Spring.
Professor Jon Goss is responsible for students in the Honors Program meeting the Clarkson Common E requirements.

Professional Experience Paperwork:
☐ **Pre-Approval Form**
☐ **Completion Form**

Table 5.4 MECHANICAL ENGINEERING CURRICULUM
Class of 2022 and Above – HONORS PROGRAM Updated 5/3/18

Student Name: **Student No:**
Advisor: **Class:**

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II **or** (4cr) BY160 Biology II (3cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II (4cr)		(F/S)
HP100* Social & Ethical… I (3cr) HP102** Intro. To Programming I (1cr)		(F) Replaces UNIV190	HP101 Social & Ethical… II (3cr) HP103** Intro. To Programming II (1cr)		(S) Replaces KA/UC Elective
FY100 FY Seminar (Honors section) (1cr)		(F)			
GPA= **CUM GPA =**		**STATUS**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**SOPHOMORE**	**SPRING**	**GR**	**SOPHMORE**
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(S)
ES260 Materials Science (TECH)		(F/S)	ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
HP200 Soph. Project Course I		(F) Replaces KA/UC elective	ME201 Intro Exp Meth in ME (C2) (1cr)		(S)
			HP201 Soph. Project Course II		(S) Replaces KA/UC Elective
GPA= **CUM GPA=**		**STATUS=**	**GPA=** **CUM GPA=**		**STATUS=**
FALL	**GR**	**JUNIOR**	**SPRING**	**GR**	**JUNIOR**
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME342 Intro to Numerical Methods		(F/S)	ME310 Thermodynamics Sys Eng **or** ME455 Mech Vibrations & Control		(S) (F)
MA330*** Advanced Eng Math		(F/S)	ME445 Integrated Design I (TECH)		(F/S)
HP300 Junior Seminar: Ways of Knowing		(F) Replaces KA Elective	HP390 Honors Thesis Proposal		(S)****See Note
ME301 Exp Meth in ME (C2) (1cr)		(F)	ME401 Adv Meth in ME (1cr)		(S)
			ES499 Professional Experience (0cr)		
GPA= **CUM GPA-=**		**STATUS=**	**GPA=** **CUM GPA=**		**Status=**
FALL	**GR**	**SENIOR**	**SPRING**	**GR**	**SENIOR**
ME411 Introduction to Heat Transfer		(F/S)	Economics Elective		
ME446 Integrated Design II (C1)		(F/S)	HP400 Seminar on Modernity		(S) Replaces KA Elective
ME324 Dynamical Systems			Undesignated Elective		
AE-ES-ME Professional Elective			Undesignated Elective		
HP490 Honors Thesis		(F)****See Note			
GPA= **CUM GPA=**		**STATUS=**	**GAP=** **CUM GPA=**		**STATUS=**

*** Students who take HP 100 are exempt from taking ES110.**
**** HP102 + HP103=ES100**
***** or MA331 and STAT383.**
****** HP390 & HP490 may each serve as a Professional Elective: Appendix L approval required for each.**
Courses are offered as follows: F-Fall, S-Spring, F/S – Fall and Spring.
Professor Jon Goss is responsible for students in the Honors Program meeting the Clarkson Common experience requirements.

Professional Experience Paperwork:
☐ **Pre-Approval Form**
☐ **Completion Form**

6.0 Other Programs

You are not limited to only one degree or one specific area of study. You may decide to obtain dual degrees, a double major, a second degree, or a concentration as described earlier. Clarkson also has an Engineering MBA-MS 4+1 program.

6. 1 Dual Degree

Dual degree is the simultaneous awarding of two Clarkson bachelor's degrees at one commencement; for instance, a Mechanical Engineering Degree and a Civil Engineering Degree. To do this you must complete 150 credit hours with at least 30 credit hours unique to each program. To obtain a dual degree you must complete a form which can be obtained from the department secretaries or from the Student Administrative Services office. A link to the form is located on the last page of the handbook.

6.2 Second Degree

A second degree is the non-simultaneous awarding of two Clarkson bachelor's degrees at two different commencements. To do this, 150 credit hours with at least 30 credit hours unique to each program must be completed. Also, at least 12 credit hours (6 of which are upper level courses) toward the second degree must be completed in residence after the awarding of the first degree. To obtain a second degree you have to be readmitted to Clarkson through the SAS office.

6.3 Double Majors

You may decide to pursue two majors while at Clarkson. Your advisor should be able to direct you to a source that can tell you the courses needed to complete the second major. A double major form must be completed to establish that you intend to do a double major; the link to the form is in the back of the handbook. According to the Clarkson Regulations, a double major[1] "…is awarded when the student satisfies all curricular requirements for two bachelor's degree programs but does not qualify for a second degree or a dual degree. A double major degree requires the completion of all requirements for both programs prior to graduation." Unlike the dual degree, however, there is no requirement for a minimum number of credits unique to each program. This means that although all curricular requirements for both degrees must be met, there is more freedom to use some courses in both programs.

6.4 Engineering MBA-MS 4 + 1 Program

The Schools of Business and Engineering have an option which allows a freshman undergraduate engineer who wants an Master of Business Administration (MBA) or Master of Science(MS) in Management Systems to plan required courses so that the graduate degree can be completed at Clarkson in one year beyond the baccalaureate.

Students in this option will be in a double major (engineering and either MBA or MS). They will be classified as engineering students with engineering advisors. Their admission to the MBA-MS program is conditional until they meet traditional School of Business admission requirements (GMAT's, etc.). Interested students should see the Director of School of Business Graduate Program.

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1 Article III-U paragraph 1.

6.5 Changing Majors

You may decide to change majors. This is accomplished by notifying the Department that you wish to enter and submitting a "Change of Major" form to that Department. This change can be made through your PeopleSoft account.

6.6 Pre-PT

Mechanical Engineering undergraduates who are interested in Physical Therapy (PT) may complete the Pre-PT requirements by selecting a prescribed set of courses in this area.

7.0 Other Issues

7.1 AP and Off-Campus Work Credit

Advanced Placement (AP) Credit can be granted to you. See Student Administrative Services (SAS) for further information and to get the credit transferred. It is best to do this as soon as possible in your freshman year.

Credit from another college or university is handled through the SAS office. Before taking a course from another university, the Off-Campus Coursework Permission form must be filled out. The link to the off campus permission form is located in the back of the handbook

7.2 Professional Engineering Exam

To obtain registration as a Professional Engineer (PE), you must first pass an examination called the Professional Engineering Exam. It is a two part exam. The first part is typically taken in the spring of the Senior year, and the second part is taken after having a certain number of years of work experience. Clarkson offers review materials for first part of the exam. For additional information on these review materials, contact Eileen Winters, Wallace H. Coulter School of Engineering, 102 CAMP.

8.0 Career Planning

8.1 Career Development Center

Inventory your interests and build a career on the aspects of engineering that you enjoy. Talking to your advisor is a good way to see what is out in the work world. Many faculty have held industrial positions before entering teaching, or are working for industry or government as a researcher or consultant. Make contact with the staff of the Career Development Center in the ERC and find out what they can do for you. Also, attend the Career Fair held each fall & spring. Many company representatives come to Clarkson for the fair and some of them are Clarkson graduates. It will be a good chance to speak to them about opportunities in the world today. After discovering your interests, you may be in a better position to choose the electives in your curriculum.

8.2 Cooperative Education Program

The Cooperative Education Program (Co-op Program) is a good way to get practical experience by working in a company for one semester. To find out more about this program contact the Career Center in

the ERC.

Students must develop a plan for meeting their program's requirements and obtain written approval of this plan from the MAE department before leaving on Co-op (a form for this may be obtained from the Career Center). This plan must account for the scheduling of required courses and their prerequisites and for the proper sequencing of the capstone courses of the AE and ME programs. For AE majors to go on Co-op after the Fall semester of the junior year and for AE and ME majors to go on Co-op in the senior year, and still graduate at the end of eight regular semesters, is difficult. *Note that "Good Standing" status is required*.

8.3 Study Abroad Program

Some students, usually in their Junior year, participate in exchange programs that Clarkson has with several universities in countries such as Sweden, England, Canada, Australia and New Zealand. To find out more details contact the Career and Professional Development Center in the ERC. The total number of credits transferred to Clarkson will not exceed 15. Prior to departure, an Off-Campus Coursework Permission form must be completed and approved for each course. In addition, students are required to meet with the MAE Executive Officer to seek his approval of the curriculum requirements and transfer credits. "*Good Standing" status is a requirement*. Exceptions to this requirement must be approved by the Mechanical and Aeronautical Engineering Department.

8.4 Undergraduate Research and Directed Study

Undergraduate students may participate in research projects with department faculty members, earning academic credit during the school year. In the summers, research projects are sometimes available at Clarkson or other universities. These usually pay a small stipend.

In a directed-study course, a student learns a subject by reading materials under the guidance of a faculty member, without lectures or other class activities. Both undergraduate research and directed study feature valuable one-on-one interactions with faculty members.

8.5 Cross-registration

Clarkson has joined with SUNY Potsdam, St. Lawrence University, and SUNY Canton in a program allowing a student to take up to two courses per year at the other institutions. Clarkson students typically use this opportunity to take language, art, education, or music courses not offered here. The link to the Cross Registration Form is in the back of this handbook.

8.6 Student Academic Records

Your academic record is kept in the Mechanical and Aeronautical Engineering (MAE) Office located in 253 CAMP. This record will be used to determine if you have met Clarkson's graduation requirements. Students should be aware of the graduation requirements and should be making sure they are meeting these requirements.

9.0 Other Societies and Activities

There are a number of honor societies, speed teams and opportunities for awards in the area of Mechanical and Aeronautical engineering they are described below:

9.1 Honor Societies

Pi Tau Sigma
Sigma Gamma Tau
Tau Beta Pi
Order of the Engineers

9.2 Activities

Clarkson's SPEED program also offers exciting extracurricular projects for students who are interested. The projects include but are not limited to:

Mini Baja. (Advisor: Professor Steven Yurgartis – CAMP 249, 268-6575) Sponsored by the Society of Automotive Engineers (SAE), Mini Baja competition is a collegiate activity between student-built amphibious, all- terrain vehicles with approximately 45 entries, mainly from the eastern half of the United States.

Formula SAE. (Advisor: Professor John Moosbrugger – CAMP 102, 268-6532) The formula SAE competition is a collegiate activity that challenges students from all over North America. The goal is to design, build, present, and race an open-wheel formula style car. The cars must be able to exhibit compliance in a technical inspection, tile test, and braking test.

Design, Build, and Fly. (Advisor: Professor Ken Visser – CAMP 361, 268-7687) The annual Design, Build, and Fly (DBF) competition, sponsored by the American Institute of Aeronautics and Astronautics (AIAA), Cessna Aircraft Company and the Office of Naval Research (ONR), entails the design and construction of a radio- controlled, electric-powered model aircraft. The project provides a team of students interested in aeronautical design and construction the opportunity to produce a product to meet a specific set of mission requirements much as a commercial venture would produce a proposal based on the customer's needs.

If you would like more information about these vehicles, or would like to work on one of them, contact the faculty advisor or MAE Department.

9.3 Awards

The MAE Department honors several deserving students each year with the following awards. These awards are presented at University Recognition Day in April.

Mechanical and Aeronautical Engineering Staff Award. Awarded annually to the outstanding junior and the most promising senior in each program. The recipients are selected by the Mechanical and Aeronautical engineering faculty members based on scholastic performance and other activities.

The Norman L. Rea Award. This award is designed for a student of mechanical engineering or electrical engineering who, in four years at Clarkson, has shown the greatest development in personality as evidenced by the following attributes: poise, tact, cooperation, insight, self-expression and confidence.

Robert E. Rosati Award for Excellence in Mechanical Engineering. Awarded annually to the outstanding junior Mechanical Engineering student who demonstrates outstanding qualities of professionalism, high scholastic achievement, humanity, good citizenship and also exhibits outstanding potential for sustained achievement in an engineering career.

The James E. Fassett Memorial Scholarship is awarded to recognize and reward an outstanding junior mechanical engineering student. The recipient will be known as the James E. Fassett Scholar. To qualify for this scholarship the student must meet specific requirements available at the Mechanical and Aeronautical Engineering Department office.

In addition, endowed and Clarkson-sponsored scholarships are available.

10.0 Clarkson Services

10. 1 Student Administrative Services (SAS) Center

The Student Administrative Services (SAS) Center combines the activities of the Bursar, Registrar and Financial Assistance offices and is located in Graham Hall on the hill campus. This office is created to fulfill most administrative needs of students.

10.2 Student Success Center (SSC) and Community Affairs

The SSC is located in 1400 Educational Resource Center (ERC). It is composed of the service organizations discussed below.

10.2.1 Counseling Center. This center offers counseling, workshops, and seminars. Topics for the workshops and seminars include time management, understanding your personality, long-distance relationships, stress control, alcohol and drug awareness, and dealing with shyness.

10.2.2 Student Support Services. The services offered include peer tutoring, academic consulting, mini-courses, and workshops. Topics for these mini-courses and workshops are, dealing with test stress, reading improvement, study skills, and academic enrichment topics.

10.2.3. Accommodative Services. This office provides services for students in need of accommodations and is located in Price Hall.

10.2.4. Foreign Student Advising. This service includes orientation and special advising for such topics as: visa, status requirements, and work regulations. (Attn: Tess Casler, 2302 ERC Center)

10.3 Local Activities

Potsdam offers many extracurricular activities. The Associated Colleges of the St. Lawrence Valley publishes a calendar of "Special Events" every month. This and other local publications list lectures, concerts, seminars, club meetings, professional societies, sports, movies, etc. that are going on in the area.

11.0 References

Clarkson Catalog. The Clarkson Catalog is no longer available in Print, but can be downloaded from: https://www.clarkson.edu/node/9301

Clarkson Regulations. The regulations that you follow are in the copy of the Clarkson Regulations (https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations) that you received upon entering Clarkson University.

Clarkson University Courses. This compilation of course descriptions are available at https://www.clarkson.edu/sites/default/files/2017-08/courses17-18.pdf

Counseling Center Pamphlet. This pamphlet is available at the Counseling Center or various other places on campus such as the Information Desk (Cheel Campus Center).

Student Administrative Services (SAS). The SAS webpage is https://www.clarkson.edu/student-administrative-services-sas

Student Telephone Book. Your telephone book will be distributed to you in the fall.

12.0 Faculty

Ajit Achuthan
Associate Professor
266 CAMP, 268-4429
PhD., School of Aeronautics & Astronautics, Purdue University
Research: Solid mechanics, smart materials and structures, nanomechanics.

Goodarz Ahmadi
Robert R. Hill '48 Professor
102 CAMP, 268-
PhD., Mechanical Engineering, Purdue University
Research: Random vibrations, turbulence modeling, multiphase lows and earthquake engineering.

Daryush K. Aidun
Professor
200 CAMP, 268- 6580
Ph.D., Materials Engineering, Rensselaer Polytechnic Institute
Research: Metallurgy**,** Weldability of Dissimilar Materials, Corrosion & Mech. Properties of Weldments and Reliability & Life Assessments of Eng. Systems.

Douglas Bohl
Associate Professor
239 CAMP, 268- 6683
Ph.D., Fluid Mechanics, Michigan State University
Research: Experimental fluid dynamics and optical diagnostics.

Ronald Buckingham
Instructor
208 CAMP, 268-6587

Cetin Çetinkaya
Professor
241 CAMP, 268-6514
Ph.D., Aeronautical & Astronautical Engineering University of Illinois
Research: Solid mechanics, stress wave propagation and stress localization in layered and composite structures, MEMS/Mechatronics, bioengineering.

Suresh Dhaniyala
Baynard C. Clarkson Distinguished Professor
204 CAMP, 268-6574
Ph.D., Mechanical Engineering
University of Minnesota
Research: Aerosol Physics, Aerosol Instrumentation and Fluid Mechanics

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Byron Erath
Assistant Professor
362 CAMP, 268-6584
Ph.D., Mechanical Engineering, Purdue University
Research: Fluid mechanics, with focus on the laryngeal aerodynamics of voiced speech

Kevin Fite
Associate Professor & Executive Officer
251 CAMP, 268-3809
Ph.D., Mechanical Engineering, Vanderbilt University
Research: Mechatronics and Prosthetic Device Design and Biomechanics

Brian Helenbrook
Paynter-Krigman Professor in Engineering Science Simulation & Department Chair
357 CAMP, 268-2204
Ph.D., Mechanical & Aeronautical Eng., Princeton University
Research: Numerical simulation, inter-facial flow, and combustion

Kathleen Issen
Associate Professor
206 CAMP, 268-3880
Ph.D., Theoretical & Applied Mechanics, Northwestern University
Research: Solid mechanics, inelastic behavior, and failure of geomaterials.

Laurel Kuxhaus
Associate Professor
2205 CAMP ANNEX, 268-6602
Ph.D., Bioengineering, University of Pittsburgh
Research: Biomechanics of the upper extremity, orthopaedic injury, ergonomics and rehabilitation

Ronald LaFleur
Associate Professor
264 CAMP, 268-3823
Ph.D., Mechanical Engineering, University of Connecticut
Research: Fluid mechanics, heat transfer and design of fluid machinery components.

Marcias Martinez
Associate Professor
234 CAMP, 268-3875
PhD., Mechanical Engineering
Carleton University
Research: Holistic Structural Integrity Process (HolSIP), Structural Health Monitoring, Load Monitoring, Smart Material Applications, Finite Element Analysis.

Ioannis Mastorakos
Assistant Professor
205 CAMP, 268-7731
Ph.D., Mechanics of Materials
Aristotle University of Thessaloniki
Research: failure of metals and alloys,Crack dislocation interactions using discrete dislocation dynamics, Defect - dislocation and grain boundary - dislocation interactions, Fatigue, creep, Crystal plasticity, Mechanical properties of nanometalic composite materials, Interfacial properties

Craig Merrett
Assistant Professor
202 CAMP, 268-6580
Ph.D., Aerospace Engineering, University of Illinois at Urbana-Champaign
Research: Aero-servo-viscoelasticity, viscoelasticity, structural dynamics, unsteady aerodynamics, flight mechanics

Arthur Michalek
Assistant Professor
2202 CAMP ANNEX, 268-2191
Ph.D. Mechanical Engineering
University of Vermont
Research: Bioengineering, mechanics of intervertebral disc injury, degeneration, and repair.

John Moosbrugger
Professor& Associate Dean CSoE
102 CAMP, 268-6532
Ph.D., Mechanical Engineering, Georgia Institute of Technology
Research: Plasticity, viscoplasticity, and experimental mechanics.

Pat Piperni
Associate Professor
356 CAMP, 268-7620
Ph.D., Mechanical Engineering
University of Montreal, Canada
Research: Aircraft and Aerodynamics and Multi-Disciplinary Optimization

Kenneth Visser
Associate Professor
361 CAMP, 268-7687
Ph.D., Aerospace Engineering
University of Notre Dame
Research: Experimental aerodynamics, flow visualization techniques, vortex flows

David Wells
Instructor
225 CAMP, 268-3970

Kenneth Willmert
Professor
367 CAMP, 268-2323
Ph.D., Mechanical Engineering,
Case Western Reserve University
Research: Computer aided design of mechanical and structural systems and the application of computer graphics in engineering analysis and design.

Steven Yurgartis
Associate Professor
249 CAMP, 268-6575
Ph.D., Materials Engineering,
Rensselaer Polytechnic Institute
Research: Mechanical properties of polymers, polymer-based composites, and carbon/carbon composites

Philip A. Yuya
Associate Professor
203 CAMP, 268-2205
Ph.D., Engineering Mechanics,
University of Nebraska-Lincoln
Research: Constitutive modeling and experimental mechanics of materials with special emphasis on biomaterials, nanofibers and polymers

Staff:

Tina Shatraw
Administrative Assistant
253 CAMP, 268-6588

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Links to Commonly Used Forms:

Add Drop Form - http://internal.clarkson.edu/sas/forms/add-drop.pdf

Cross Registration Form - http://www.associatedcolleges.org/services/CrossRegForm%20rev%202014.pdf

Dean's Exception Form - http://internal.clarkson.edu/sas/forms/requestforexceptionfillable.pdf

Directed Study for Summer Form: http://internal.clarkson.edu/sas/forms/dsugrdform.pdf

Off Campus Permission Form - http://internal.clarkson.edu/sas/forms/off-campusformfillable.pdf

Undergrad taking Grad Course - http://internal.clarkson.edu/sas/forms/ugrdtakinggradcoursefillable.pdf