

# GRADUATE HANDBOOK

## FOR GRADUATE STUDENTS

### ENTERING FALL 2011

MECHANICAL ENGINEERING DEPARTMENT  
76 LOMB MEMORIAL DRIVE  
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## INTRODUCTION

The Kate Gleason College of Engineering, the only engineering college in the USA named for a woman, offers Bachelors and Masters degree programs in computer, electrical, industrial, mechanical, and microelectronic engineering, as well as BS programs in chemical and biomedical engineering, a master's degree in applied statistics, and a multi-disciplinary doctoral program in Microsystems engineering. The college strives to develop the critical engineering talent that our many industry partners need to thrive in today's competitive marketplace; and, in so doing, the college provides excellent career opportunities for its students.

The Mechanical Engineering Department is the largest academic department in the Kate Gleason College of Engineering, with a headcount of approximately 875 students in first year through graduate programs. We offer Bachelor of Science Degrees in Mechanical Engineering, and undergraduate options in Automotive Engineering, Aerospace Engineering, Energy and the Environment, and Bioengineering. At the graduate level, we offer Master of Science and Master of Engineering Degrees, and an Advanced Certificate in Vibrations Engineering. Traditionally, we have three primary tracks of enrollment for our graduate programs: dual degree students, who are working on a Bachelor's and Master's degree concurrently; full time Master's degree students; and part-time Master's degree students. Many of our graduate courses are taught in the late afternoon and early evening to accommodate our part-time students. The Mechanical Engineering Department has undergraduate and graduate students enrolled at both our Rochester NY, USA campus and our Dubai, UAE campus.

The Master of Science degree program consists of two required mathematics courses, three courses in a focus area, graduate electives, and a thesis. Research is being conducted across the ME curriculum in a wide range of areas Biomedical devices, control systems, energy systems, boiling heat transfer, MicroElectroMechanical Systems (MEMS) and finite element analysis. Additional information about the research interests of our departmental faculty may be found in the faculty profiles, and at our web site. A minimum of 45 quarter-credit hours are required for the M.S. degree. All M.S. students are required to defend their thesis before an examining committee. Most are encouraged by their advisor to write a paper based on their thesis for a technical conference.

The Master of Engineering degree program leads to the professional degree of Master of Engineering. The objective of the program is to provide the engineering BS graduate the means for earning a terminal master's degree based largely on graduate course work, and without the conventional thesis requirement of an MS degree. The Master of Engineering program, although rooted in Mechanical Engineering, may be significantly interdisciplinary. By design, a student's program may range over several colleges of the Institute in assembling courses which will best help him or her meet his or her professional objectives. The Master of Engineering program consists of a required mathematics course, a required numerical analysis course, a concentration area of four courses, and graduate electives. Students working full-time as an engineering professional may be able to complete an optional industrial internship of up to 4 graduate credits. A minimum of 48 quarter-credit hours are required for the M.Eng. degree.

The department has extensive computing facilities, with access to a wide variety of software packages (ANSYS, MATLAB, FLUENT, Pro-Engineer, LabView, etc.) as well as a dedicated CFD computer lab. We have many excellent experimental facilities including the Thermal Analysis Laboratory, Biomedical Device Engineering Lab, Bioengineering Lab, Particle Imaging Velocimetry Lab, Thermo-electric Lab, Advanced Materials Laboratory, the Vibrations Laboratory, the Robotics Laboratory, Measurement Instrumentation and Controls Laboratory, the Systems Laboratory, Wind Tunnel, numerous undergraduate labs, and a well-equipped machine shop. Our graduate students often work in laboratories and centers outside of the department, such as the Semi-

Conductor Manufacturing and Fabrication Lab (SMFL clean room), the Center for Integrated Manufacturing Systems, the Brinkman CNC lab, and numerous others.

A limited number of graduate tuition scholarships are available, primarily to full time graduate students, on a competitive basis. Scholarships are based on academic merit, and students must maintain at least a 3.0 GPA at all times, and be in good academic standing to be eligible for scholarships. A number of teaching and research assistantships are available for full-time students; these are typically 20 hr/week assignments. Assistantships provide a stipend and partial tuition remission. Students must maintain at least a 3.0 GPA at all times, and be in good academic standing to be eligible for assistantships.

## CALENDAR CONVERSION

RIT will be transitioning from the Quarter-based academic year to a Semester-based academic year with the beginning of the Fall term in 2013. Since you are entering as a graduate student in the Fall of 2011, you will be likely to complete your degree prior to the conversion to the semester system. If you are a part-time student, you may begin your degree in the quarter system and complete your degree in the semester system. The conversion schedule is illustrated in the Table below:

Year 11-12	AY 2011-12 Fall Quarter	AY 2011-12 Winter Quarter	AY 2011-12 Spring Quarter	AY 2011-12 Summer Quarter
Year 12-13	AY 2012-13 Fall Quarter	AY 2012-13 Winter Quarter	AY 2012-13 Spring Quarter	AY 2012-13 Summer Quarter
Year 13-14	AY 2013-14 Fall Semester	AY 2013-14 Spring Semester	AY 2013-14 Summer Semester	
Year 14-15	AY 2014-15 Fall Semester	AY 2014-15 Spring Semester	AY 2014-15 Summer Semester	
Year 15-16	AY 2015-16 Fall Semester	AY 2015-16 Spring Semester	AY 2015-16 Summer Semester	

The transition has been planned out very carefully, and you will be able to move seamlessly from quarters to semesters by following the advice presented herein, and working closely with your faculty and staff advisers during your program of study.

The faculty have developed a mapping plan for the courses, so that you will be able to complete your degree with a combination of quarter-based courses and semester-based courses. Under the quarter system, most of your courses will be 4 quarter credit hours (4 QCH), while under the semester system most of your courses will be 3 semester credit hours (3 SCH). A typical 4 QCH lecture course meets for nominally 4 hours per week, for 10 weeks, giving 40 contact hours; while a typical 3 SCH lecture course meets for nominally 3 hours per week, for 15 weeks, giving 45 contact hours.

The Master of Science program consists of a total of 45 QCH or 30 SCH. Thesis is a required element of the MS degree.

The Master of Engineering program consists of a total of 48 QCH or 30 SCH. One of several possible capstone choices is a required element of the MEng degree.

## MASTER OF SCIENCE IN MECHANICAL ENGINEERING PROGRAM REQUIREMENTS

Note that information presented in this document is superseded by information presented in the Graduate Bulletin, which contains all official requirements for degree completion. In the event of a disagreement between this summary and the Graduate Bulletin (published on the RIT website), the Graduate Bulletin takes precedence.

### OVERVIEW

The Master of Science degree program consists of four elements of study. These include the (1) two required mathematics courses, (2) three courses in a focus area, (3) a series of graduate electives, and (4) a thesis. A minimum of 45 quarter-credit hours are required for the M.S. degree. All M.S. students are required to defend their thesis before an examining committee. Most M.S. students publish an article about their research with their advisor.

### CORE MATHEMATICS COURSES (8 QCH CREDITS)

All graduate students in the MS program are required to complete two required core courses:

- 0304-870 Mathematics for Engineers I
- 0304-871 Mathematics for Engineers II (or an alternative course approved by the adviser and department head).

### FOCUS AREA COURSES (12 QCH CREDITS)

All graduate students in the MS program must develop a graduate focus area of study, with prior approval from their advisor and the department head. The focus area should consist of at least 12 credits of graduate study in mechanical engineering, (0304-7xx or higher) and be related to the student's technical and professional development interests. Examples of focus areas include controls, materials science, thermo/fluids, and mechanics/design.

### GRADUATE ELECTIVE COURSES (16 QCH CREDITS)

Courses numbered 0304-7xx or 0304-8xx may be taken for graduate elective credit. Based on the student's particular program needs, he or she may, with prior department approval, elect to take up to 8 credits from other departments in the Institute. M.S. students are allowed to take a maximum of two upper-level undergraduate (0304-6xx) electives in mechanical engineering specified in the course description section of the Undergraduate Bulletin. Note that students may not take an undergraduate technical elective for graduate credit if they have completed a similar course towards an undergraduate degree either at RIT or another institution.

A student may earn a limited number of credits by doing an independent study (0304-880) with guidance from a member of the graduate faculty. A written proposal must be prepared by the student in cooperation with the sponsoring faculty member, and submitted for approval by the department head prior to the commencement of work.

### MASTERS THESIS (9 QCH CREDITS)

Upon matriculation into the MS program, the student will be assigned a temporary adviser to assist with scheduling the first quarter of classes. Prior to the end of the first quarter, the graduate student should identify a faculty adviser for their thesis, and formulate plan of study in consultation with their adviser and the department head. Note that the

advisor/student and topic selection process must be a mutual one. Often, achieving a good relationship between the student and advisor, and identifying a meaningful topic for study is a key element in a successful Master's degree program. Usually by the end of the first quarter, but sometimes during the second quarter, the student should complete a formal thesis proposal for review by the advisor. The advisor will then review the proposal, and when it is ready for submittal, will request the student to submit the proposal for departmental approval. An approved proposal is required prior to enrolling for thesis credits.

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## GRADUATE SEMINAR (0 QCH CREDITS)

All full time graduate students are expected to attend the weekly graduate seminars.

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## COURSE ROTATION

The core courses are offered every year, which enables a student to fulfill the core requirements in one academic year. The elective courses are generally given at least every other year. For further information on current course offerings, the student may look at the on-line schedule of classes, (<http://infocenter.rit.edu/>) (which generally posts courses up to one year in advance.

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## TRANSFER OF COURSES AND RESIDENCY REQUIREMENTS

A maximum of nine quarter credits with a grade of B or better may be transferred from graduate courses taken outside the Institute provided such courses will complement a student's proposed graduate M.S. program in the mechanical engineering department.

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## ADMISSION REQUIREMENTS FOR THE M.S. DEGREE

A bachelor of science degree in engineering or science is required. We normally look for an undergraduate B.S.M.E. degree from an ABET accredited engineering program with a GPA of at least 3.0 on a 4.0 scale to be considered for full admission into the M.S. program. Students are required to submit the results of GRE testing for consideration of admission into the M.S. program. International students are also required to submit the results of TOEFL testing.

Admission to the M.S. program is highly competitive. Most students are first admitted to the M.Eng. program. Students enrolled in the M.Eng. program may apply for a change of program to the M.S. degree program after they have demonstrated excellent performance following 20 or more credits of graduate course work in their MEng program, and submitting a thesis proposal with the endorsement of a faculty member who agrees to be their thesis advisor.

Students with an undergraduate degree in Mechanical Engineering Technology are not directly admissible to the Master's degree programs in Mechanical Engineering. Mechanical Engineering Technology graduates may typically complete a second BS degree in Mechanical Engineering with the completion of 75 to 115 additional quarter credits of study beyond the BS MET degree. MET students who took the University Physics sequence and the complete calculus sequence will generally have fewer credits to complete for the second BS degree, as illustrated in the Appendix.

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## THESIS REQUIREMENTS

Selection of a thesis topic and completing the independent research work commensurate with the thesis is a central aspect of the Master of Science degree program. The student should take great care in identifying a topic of interest to

them, and of mutual interest to the faculty advisor. Students who leave the decision of a thesis topic until late in their graduate program, and are slow to get started on their literature review and background research historically have a lower probability of successfully completing their degree.

A Master's program of study is quite different from an undergraduate program, particularly because of the manner in which the student is expected to self-direct their thesis work, and to be self-motivated and determine their own schedule.

**ROCHESTER INSTITUTE OF TECHNOLOGY**

Master of Science in Mechanical Engineering

(required for registration for 0304-890)

Program (check one)  EMEM or  EMEB (Dual Degree) Today's date \_\_\_\_\_

Student Name \_\_\_\_\_

Student UID \_\_\_\_\_

PROPOSED THESIS TITLE: \_\_\_\_\_

**Attach a formal proposal with an abstract, statement of work, and literature review, signed by you, and approved by your thesis advisor. Also attach a signed statement of compliance with the academic honesty policy.**

Projected number of thesis credit hours per quarter

Fall \_\_\_\_\_ Winter \_\_\_\_\_ Spring \_\_\_\_\_ Summer \_\_\_\_\_ Total \_\_\_\_\_

**Signatures:**

Student \_\_\_\_\_ Date \_\_\_\_\_

Faculty Advisor \_\_\_\_\_ Date \_\_\_\_\_

Committee Member \_\_\_\_\_ Date \_\_\_\_\_

Committee Member \_\_\_\_\_ Date \_\_\_\_\_

Committee Member \_\_\_\_\_ Date \_\_\_\_\_

Department Head \_\_\_\_\_ Date \_\_\_\_\_

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## THESIS OUTLINE

A starting point for your thesis outline is presented here. You should work with your advisor to adjust this outline for your specific needs.

### Front Matter

- Title Page
- Abstract
- Dedication, Acknowledgement, or Recognition (if applicable)
- Table of Contents
- List of Figures and Tables (with page numbers, if applicable)
- List of Variables and Abbreviations (if applicable)

### Body of the Thesis

- Problem Statement, Statement of Work, or Introduction
- Literature Search
- Background and Supporting Material
- Analysis
- Experiments
- Interpretation of Results
- Recommendations and Conclusions

### Back Matter

- Bibliography
- Appendices (which may include material such as...)
  - Engineering Drawings
  - Logbook pages
  - Photographs
  - Experimental Data
  - Detailed graphs and Charts

M.S. PROGRAM OF STUDY FORM

Student Name: \_\_\_\_\_ Entry Term: \_\_\_\_\_

ID #: \_\_\_\_\_ 7 Year Limit: \_\_\_\_\_

Advisor Name: \_\_\_\_\_

**Core courses**

Term	Grade	Number	QCr	Course Name
_____	_____	0304-870	4	Mathematics for Engineers I
_____	_____	0304-871	4	Mathematics for Engineers II
_____	_____	0304-890	9	Graduate Capstone: Research and Thesis

**Focus Area:**

Term	Grade	Number	QCr	Course Name
_____	_____	_____	4	Focus Area Course 1
_____	_____	_____	4	Focus Area Course 2
_____	_____	_____	4	Focus Area Course 3

**Graduate Elective Courses<sup>+++</sup>**

Term	Grade	Number	QCr	Course Name
_____	_____	_____	4	Grad Elective (0304-600 or higher) *, **
_____	_____	_____	4	Grad Elective (0304-600 or higher) *, **
_____	_____	_____	4	Grad Elective **, ***
_____	_____	_____	4	Grad Elective +, ***

**45 Total Quarter Credits for M.S. Degree Completion**

**Foot Notes:**

- \* Up to two technical electives 0004-6xx from Mechanical Engineering may be used towards the M.S. Degree
- \*\* Students in the BS/MS Program may double-count no more than 12 QCH credits towards both degrees.
- \*\*\* Up to two graduate level classes from outside of the department may be used, with prior approval from the department head.
- + Students considering the MS program may take 0304-701 Research Methods to prepare a thesis proposal.

## M.S. APPLICATION FOR DEGREE

A degree application form is shown in the Figure below. Please make sure you submit this form at least two quarters prior to your last quarter of enrollment!

**R·I·T** Rochester Institute of Technology  
Office of the Registrar  
716-475-6119

### APPLICATION FOR GRADUATION

**Directions:** Complete a separate copy of the form for each degree you request to receive and return it to the appropriate department four quarters prior to the completion of your requirements for that degree. This will enter an anticipated graduation date into the Student Record System. Do not request to be honored until you are eligible for graduation. You must check with your department to make certain that you have met all academic requirements for a degree.

Student ID Number: \_\_\_\_\_

Name: Print your name as you wish it to appear on your diploma, paying special attention to upper and lower case letters and spacing. Names on diplomas must match your official name as recorded in the Registrar's Office.

Last: \_\_\_\_\_  
First: \_\_\_\_\_  
Middle: \_\_\_\_\_  
Suffix: \_\_\_\_\_

Degree: Check the degree that you expect to receive:

<input type="checkbox"/> Bachelor's	<input type="checkbox"/> Bachelor of Science (B.S.)
<input type="checkbox"/> Ph.D.	<input type="checkbox"/> Bachelor of Fine Arts (B.F.A.)
<input type="checkbox"/> M.S.A.	<input type="checkbox"/> M.S.
<input type="checkbox"/> M.E.	<input type="checkbox"/> M.A.
<input type="checkbox"/> M.F.A.	<input type="checkbox"/> M.A.S.
<input type="checkbox"/> M.B.	<input type="checkbox"/> M.A.S.
<input type="checkbox"/> M.B.T.	<input type="checkbox"/> M.S.
<input type="checkbox"/> ADVANCED GRADUATE CERTIFICATE	<input type="checkbox"/> DIPLOMA
	<input type="checkbox"/> CERTIFICATE

Program Code: \_\_\_\_\_

Are you planning to continue your education at RIT/STUD? Yes \_\_\_\_\_ No \_\_\_\_\_

Graduation Date: Enter the month and year you anticipate completing all graduation requirements for this degree.  
 November  February  May  August Year: \_\_\_\_\_

Hometown Address: Will be used in the Commencement Program only. Your diploma will be sent to your home address as reflected in the Student Record System.  
City, Town or Village \_\_\_\_\_ State \_\_\_\_\_ County \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Department Stamp: \_\_\_\_\_

Registrar's Office Use Only:  
Date Received: \_\_\_\_\_  
Date Processed: \_\_\_\_\_  
Processed By: \_\_\_\_\_

Distribute: Registrar Rev-001

Two academic quarters prior to your anticipated degree completion, each student should prepare and submit an application for degree form. These forms are available in the Mechanical Engineering Department office. Please note that you need to fill out one form for every degree you will be completing, if you happen to be working on multiple degrees.

## M.S. DEGREE COMPLETION CHECKLIST

- First, get approval of your FINAL DRAFT of your thesis from your adviser and committee members.
- After your advisor has approved your defense application you may:
  - Schedule a time, date and location for your defense. The thesis must be distributed to your committee at least 2 weeks prior to the defense.
  - Check with your committee members, and advisor to ensure that they will all be available. Typically, you should allow at least two hours for your defense.
  - The ME Department will assign a departmental representative to sit on your thesis committee and participate in your final defense. The department representative will be Dr. Edward Hensel, Jr, Dr. Wayne Walter or Dr. Alan Nye or another person appointed by the department.
  - Prepare a one paragraph announcement to be used as an abstract in announcing your thesis defense.
  - Submit an abstract to Diane Selleck ([dmseme@rit.edu](mailto:dmseme@rit.edu)) or Diedra Livingston ([djleme@rit.edu](mailto:djleme@rit.edu)) in the mechanical engineering office. They will publish the announcement to advertise for fellow students and faculty, at least 10 working days prior to your defense.
  - Distribute the COMPLETE FINAL DRAFT of your thesis, in soft-bound format, with all drawings, tables, data, appendices, front pages present to each member of your committee and the department representative **at least 10 working days** prior to the date of your thesis defense.
- Prepare a formal presentation of your thesis in cooperation with your advisor. Your advisor will suggest the appropriate level of technical detail, length of presentation, etc.
- Defend your thesis before the members of your thesis committee, and a representative of the department. Other students, outside visitors, and staff may attend your defense with the approval of your advisor. Only committee members and departmental faculty may freely question the candidate. Any visitors to the defense should address their questions to the advisor, who will decide whether or not to refer the question to you, the degree candidate. Thesis presentations may be closed to the public if the topic is proprietary.
- You will be notified of the outcome of your defense following your defense. As committee members may take a substantial amount of time to deliberate upon, and reflect upon, your defense and your thesis, the decision and notification may not be given the same day as your defense.
- The committee will arrive at a consensus of one of the following outcomes of your defense.
  1. Conditional Pass. Your defense has been deemed a success, Minor corrections and/or revisions may be required. These revisions will be communicated to you and by your thesis advisor. You must complete the revisions to your advisors satisfaction within 10 working days.
  2. Adjournment. While your defense was productive, the committee has determined that significant revisions are required. The nature of these revisions will be communicated to you in writing by your thesis advisors. You should complete these revisions to your advisors satisfaction. The committee will reconvene to evaluate your revisions and decide if they are acceptable. At least one academic quarter must elapse between the adjournment and reconvening the committee.

3. Failure. The committee has deemed your defense to be unsuccessful. All thesis credits completed to date will not be usable towards a degree. If you wish to complete a thesis, you must begin again with a new proposal. You may apply for change of program to the master of engineering degree.

After you make all corrections and have them approved by your advisor (and the committee, if required), please complete the following:

- You are responsible for duplicating sets of the thesis for binding. You must prepare a minimum of 4 originals of your thesis, including one for the thesis advisor, one for the department, one for the library, and one for the student. The 4 original theses should have title pages with original ink signatures. You may make additional copies of your thesis for your own use, if you wish. You are responsible for the costs associated with your personal copies. Your advisor may request additional copies of your thesis if he or she wishes. Your advisor will be responsible for the cost of additional copies that they request.
- Mechanical Engineering Students must have their thesis published electronically through the RIT Wallace Library. Electronic publication will provide greater access to your thesis by other researchers.
- There is a charge for binding of \$14.00 per copy that must be paid to the cashier's office in the Administrative Service Center (Bldg 87) You are responsible for paying the binding costs of the department (1), advisor (1), and your personal copies (1 or more). The library pays the binding cost for their copy (1). If you or your advisor wish to bind supplemental copies, you and the advisor are responsible for those costs, respectively.
- After you receive the receipt from the cashier's office, take it with all sets of your unbound copies to cataloging department the library. The library will send all copies to the bindery.
- Remember to ask the librarian for a receipt for the submission of thesis and bring that receipt to Diane Selleck in the Mechanical Engineering office. YOUR CERTIFICATION (I.E. GRADUATION) CANNOT BE COMPLETED WITHOUT THIS RECEIPT OR A COPY OF THE BOUND THESIS.
- Thesis binding usually takes about two weeks, so make sure you have your correct contact information with the department and the registrar's office. It's especially important because your diploma will go to whatever the permanent address is on the computer.
- Turn in all departmental keys and equipment
- Clear all accounts at the student financial services office
- Return all books to the library
- Return all books and materials you borrowed from professors!
- DEGREE CERTIFICATION. Degrees are certified by the registrar four times per year, after each academic quarter.

## MASTER OF ENGINEERING IN MECHANICAL ENGINEERING PROGRAM REQUIREMENTS

*Note that information presented in this document is superceded by information presented in the Graduate Bulletin, which contains all official requirements for degree completion. In the event of a disagreement between this summary and the Graduate Bulletin (published in the RIT web site), the Graduate Bulletin takes precedence.*

### OVERVIEW

This program leads to the professional degree of Master of Engineering. The program provides the engineering BS graduate the means for earning a terminal master's degree without the conventional thesis requirement of an MS degree. The Master of Engineering Degree program has a strong career oriented focus, and is primarily directed towards students not considering continued graduate study at the doctoral level. The M. Eng. degree is particularly well-suited to part-time study, students interested in updating their technical skills, and those who are not focused on a research-oriented career. The M. Eng. degree program is becoming increasingly popular in the USA, and is a first choice for many practicing engineers who wish to gain more technical depth in engineering, and prepare themselves for new challenges and opportunities in the workplace. The M. Eng. degree may be highly customized towards an individual's career interests.

The Master of Engineering degree program consists of four elements of study: (a) three required core courses (12 credits), (b) four courses (16 credits) in a chosen concentration, (c) a series of graduate electives (16 credits), and (d) a capstone requirement (4 credits). A minimum of 48 quarter-credit hours are required for the M.Eng. degree. At least 32 credit hours of graduate-level course work must be taken in the Mechanical Engineering Department.

### CORE COURSES (12 QCH CREDITS)

All graduate students in the M.Eng. program are required to complete the following core courses:

- 0304-870 Mathematics for Engineers I
- 0304-823 Systems Modeling
- 0304-865 Computer Implementation of FEM
- 0304-871 Mathematics for Engineers II **will replace one elective for all students completing their degree after August 2013**

### CONCENTRATION COURSES (16 QCH CREDITS)

All students in the M.Eng. Program are required to develop a concentration area by completing 16 credits of study in an area. Concentration areas include business, controls, print media, materials science, statistics and design engineering. Students may also elect concentrations within mechanical engineering such as thermo-fluids, systems & controls, mechanics & design, or vibrations. Students with a specific career interest may develop an individually customized concentration based on mutual agreement between the student and the department.

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## AVAILABLE CONCENTRATIONS

### **Business (Two Required + Two Electives)**

Dual degree BS/MEng Students must have completed at least 168 credits prior to enrolling in the required courses, and must have completed at least 180 credits, and meet all course pre-requisites prior to enrolling in the elective courses.

0101-703 Financial Accounting Systems **(Required)**

0102-740 Organizational Behavior and Leadership **(Required)**

Students may take any two graduate College of Business Electives, 010n-7xx, with satisfactory pre-requisites.

### **Systems and Controls (Select four courses)**

0301-761 Modern Control Theory

0301-762 Nonlinear Control Systems

0304-643\* Control Systems

0304-743 Intermediate Control Systems

0304-843 Advanced Control Systems

0301-702 Random Signals and Noise

### **Manufacturing (Select four courses)**

0304-638\* Design of Machine Systems

0303-801 Design for Manufacture

0303-720 Production Control

0303-740 Numerical Control and Manufacturing

0304-864 Production Tool Design

### **Vibrations Engineering**

0303-658\* Engineering Vibrations

0304-758 Intermediate Engineering Vibrations

0301-702 Random Signals and Noise

0304-871 Math for Engineers II

### **Mechanics and Design (Select four courses)**

0304-638\* Design of Machine Systems

0304-658\* Engineering Vibrations

0304-672\* Dynamics of Machinery

0304-754 Fatigue and Fracture Mechanics

0304-758 intermediate Engineering Vibrations

0304-816 Finite Elements

0304-885 Advanced Mechanics of Solids

### **Thermo / Fluids Engineering (Select four courses)**

0304-756 Aerosols in the Respiratory Tract

0304-830 Intro to CFD Analysis

0304-831 CFD Applications

0304-833 Heat Exchanger Design

0304-834 Boiling and Condensation

0304-838 Ideal Flows

0304-847 Microscale Heat and Mass Transfer

0304-851 Convective Phenomena

**Materials Science (Select four courses)**

0304-644*	Intro to Composite Materials
0304-645*	Biomaterials
0304-745	Micro- and Nano- Characterization of Material Surfaces
0304-746	Engineering Properties of Materials
0304-754	Fatigue and Fracture Mechanics

**Automotive Systems (Select four courses)**

This concentration is for students who have completed their BS degree at a school other than RIT, and did not participate in the BS Automotive Option. M.Eng. Students must complete at least 36 credits at the graduate level.

0304-623*	Power Train Systems and Design
0304-624*	Vehicle Dynamics
0304-640*	IC Engines
0304-643*	Control Systems
0304-710	Fuel Cell Technology
0304-743	Intermediate Controls
0304-752	Fundamentals of Tribology and Lubrication
0304-758	Intermediate Vibrations
0303-801	Design for Manufacturing

**Product Development** (Enrollment is limited and requires permission of the Masters in Product Development - MPD Program)

0303-786	Engineering of Systems I
0303-788	Engineering of Systems II
0303-784	Systems and Project Management
0303-785	Engineering Risk / Benefit Analysis

\* A maximum of three undergraduate technical elective courses may be counted towards the MEng degree.

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**ELECTIVE COURSES (16 QCH CREDITS)**

Courses numbered 0304-7xx or 0304-8xx may be taken for graduate elective credit. M.Eng students are allowed to take a maximum of two upper-level undergraduate (0304-6xx) electives in mechanical engineering specified in the course description section of the Undergraduate Bulletin. Note that students may not take an undergraduate technical elective for graduate credit if they have completed a similar course towards an undergraduate degree either at RIT or another institution. A student may earn a limited number of credits by doing an independent study (0304-880) with guidance from a member of the graduate faculty. A written proposal must be prepared by the student in cooperation with the sponsoring faculty member, and submitted for approval by the department head prior to the commencement of work.

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## CAPSTONE REQUIREMENT (4 QCH CREDITS)

The capstone requirement for the Master of Engineering degree may be a project team leadership experience, a course-based design project, a graduate internship or an independent study project. Students completing the B.S. and M.Eng. degrees concurrently are expected to enroll in Design Project Management and take a leadership role on their senior design team. The capstone requirement for practicing engineers will consist at least of an exit interview and degree review with the department head or his representative.

All graduate students in the M.Eng. program are required to complete one of the four following capstone requirements:

- 0304-701            Research Methods (For students who considered the M.S. but decided to complete the M.Eng.)
- 0304-730            Design Project Management (Required for BS/MEng Students)
- 0304-888            Project With Paper (For most full-time MEng Students)
- 0304-877            Graduate Internship (For most part-time MEng Students)

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## GRADUATE SEMINAR (0 QCH CREDITS)

All full time graduate students are expected to attend the weekly graduate seminars.

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## COURSE ROTATION

The core courses are offered every year, which enables a student to fulfill the core requirements in one academic year. The elective courses are generally given at least every other year. For further information on current course offerings, the student may look at the on-line schedule of classes, (<http://infocenter.rit.edu/>) (which generally posts courses up to one year in advance.

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## TRANSFER OF COURSES AND RESIDENCY REQUIREMENTS

A maximum of twelve quarter credits with a grade of B or better may be transferred from graduate courses taken outside the Institute provided such courses will complement a student's proposed M.Eng. graduate program in the mechanical engineering department.

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## ADMISSION REQUIREMENTS FOR THE M.ENG. DEGREE

1. A bachelor of science degree in engineering or science is required.
2. Students holding an undergraduate B.S.M.E. degree from an ABET accredited engineering program with a GPA of at least 3.0 on a 4.0 scale will be considered for full admission into the M.Eng. program.
3. International students are required to submit the results of TOEFL and GRE testing for consideration of admission into the M.Eng. program.
4. If an applicant has a BS degree, but not in mechanical engineering, they may be required to complete bridge courses either prior to matriculating in the Master of Engineering program, or during their program of study. Details of bridge course requirements are handled on an individual basis.

5. Students with an undergraduate degree in Mechanical Engineering Technology are not directly admissible to the Master's degree programs in Mechanical Engineering. Mechanical Engineering Technology graduates may typically complete a second BS degree in Mechanical Engineering with the completion of 75 to 115 additional quarter credits of study beyond the BS MET degree. MET students who took the University Physics sequence and the complete calculus sequence will generally have fewer credits to complete for the second BS degree, as illustrated in the Appendix.

Students enrolled in the M.Eng. program may apply for a change of program to the M.S. degree program after they have demonstrated excellent performance following 20 or more credits of graduate course work in their M.Eng. program, and submitting a thesis proposal consisting of an abstract, statement of work, timeline, and literature research. This needs to come with an endorsement from a faculty member who agrees to be their thesis advisor.

## GRADUATE INTERNSHIP PROGRAM

Students may elect to complete a graduate internship to satisfy the capstone requirement. In order to receive credit for your internship, you will need to prepare a brief (2-3 page) report of your duties and responsibilities at the conclusion of your internship, and file both student and employer internship evaluation forms with the M.E. office.

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### GRADUATE INTERNSHIP GUIDELINES

The optional graduate industrial internship program is fundamentally different from the undergraduate co-op program, and this optional activity is primarily directed towards part-time students who are practicing engineers.

As a practicing engineer, working towards an M.Eng. degree, your normal day-to-day duties should involve significant engineering and technology oriented tasks. A major goal of the M.Eng. degree is to assist you with making progress towards your career goal. Thus, your graduate internship should require a significant increase in your level of professional responsibility over your current duty assignment. For example, if you are currently a design engineer working under the direction of a senior engineer, then the internship may be for you to take on a position as the engineer in charge, and have other engineers report to you as the senior engineer on the project. If you are in a production environment, then the internship may be to increase your level of financial responsibility, the scope of your management responsibility, etc.

Your employer may view the internship as a "probationary promotion" preparing you for the next logical step in your career. Ideally, upon completion of the internship, your employer and you would decide to make the new position permanent. However, this is not required to receive credit for the internship. Based on the internship, you or your employer may decide on a different career direction, or there may simply be no permanent openings available at the current time. These results, as well as the nature of your duty assignment, should be summarized in a brief (2-3 page) report at the conclusion of your internship. Both the student and the employer must submit internship evaluation forms to the M.E. office. An internship review rubric must be completed by the employer and the student.

The graduate internship is not designed for the student to seek new employment, summer employment, or other temporary employment. Exceptions to this guideline may be made for students who are participating in recognized graduate internship programs such as those sponsored by National Laboratories, Universities, and formal private sector internship programs.

Prior approval must be obtained for all graduate internships. Credit cannot be granted for work completed prior to completion of at least 20 credits of work towards the M.Eng. degree, so that the internship truly builds upon the students' graduate education.

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GRADUATE INTERNSHIP PROPOSAL

**ROCHESTER INSTITUTE OF TECHNOLOGY**

**Master of Engineering in Mechanical Engineering**

**(required for registration for 0304-877)**

Student Name \_\_\_\_\_

Student UID# \_\_\_\_\_

Date \_\_\_\_\_

PROPOSED INTERNSHIP JOB TITLE \_\_\_\_\_

Internship Description: Attach a formal job description, statement of work and engineering responsibility, description of how this internship increases your responsibility over your current duties, signed by you, and approved by your work supervisor.

**Signatures:**

Student \_\_\_\_\_

Date\_\_\_\_\_

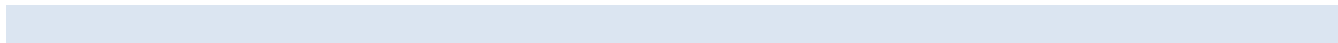
Work Supervisor \_\_\_\_\_

Date\_\_\_\_\_

ME Department \_\_\_\_\_

Date\_\_\_\_\_

**Notes:**



## OPTIONAL GRADUATE COOPERATIVE EDUCATION PROGRAM

### WHAT IS GRADUATE COOPERATIVE EDUCATION?

Are you the kind of person who learns best through experience? Do you like to try things out for yourself? Do you like to test the theories you've been taught and find out what does and doesn't work in the real world? If so, you should take a closer look at RIT's cooperative education (co-op) program.

For more than 90 years, the hallmark of an RIT education has been the practical, paid work experience provided through cooperative education. RIT was among the first universities to begin cooperative education back in 1912, and today our co-op program is the fourth oldest and one of the largest in the world. Because of its success, RIT's co-op program is well known and highly respected.

Cooperative education at RIT will take you beyond books and lectures into the real world. You may work in manufacturing, design, software development, test and evaluation, or any of the varied fields that employ mechanical engineers. Whatever you do, RIT's cooperative education program will give you the experience you need to set yourself apart from other graduates in your career field.

RIT's emphasis on career education and our highly respected cooperative education program often motivates students to choose RIT over other colleges. If you participate in the optional graduate co-op program for as part of your Master of Engineering degree, your co-op experience will be an exciting part of your RIT education. By the time you graduate you will be well on your way to achieving your career goals.

Students coming to RIT who have completed their BS degree at another institution have often not had the benefit of participating in a co-operative education program. These students often find that the graduate co-op program at RIT offers them a competitive advantage in the market place, provides them with highly valuable experience, and exposure to modern industrial practices.

Graduate co-op is a great way to help defray the costs of your degree as well. By alternating between time on campus and on-the-job, you can earn significant income while gaining great exposure to wonderful companies!

The optional graduate co-op program is primarily directed towards full-time M.Eng. students who are seeking to gain additional work experience, and exposure to various potential employment fields. Please note that students in the Master of Science degree program are not eligible for participation in the graduate co-op program, since they must remain focused on their thesis research.

### GRADUATE COOPERATIVE EDUCATION FOR INTERNATIONAL STUDENTS

The following is an overview of practical issues related to employment in the U.S., as well as tips to help you in your job search. International students may encounter more difficulty in securing co-op or full-time jobs than do full-time residents or U.S. citizens. Many employers use co-op as a means of recruiting for full-time positions, and sometimes don't wish to give a co-op position to a student who will not be able to work at the company on a long term basis. All jobs with the Federal Government require citizenship. Also, companies who have contracts with the government also require U.S. citizenship (in some cases, they will allow permanent residents) for their positions.

In order to acquire practical training in the U.S., it is not enough to be equal to your American competitor. Rather, your qualifications must be superior to your competition. You should put extra effort into writing a resume and cover letter

that highlight your appropriate skills and experience. Countries have different, acceptable styles of resume writing and interviewing. See your program coordinator in the RIT Office of Co-op and Career Services early, preferably two quarters before you intend to co-op or graduate for assistance.

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## IMMIGRATION ISSUES

In order to work in the United States, you must have a Social Security Number and Card. Applications are available at the Social Security Office, 100 State Street (downtown), Rochester, New York. Take your passport, I-94 and I-20 or IAP-66, and a letter from an international student advisor with you. The process takes from two to six weeks to complete. (Most often the ISS office will have application forms.)

All international students **MUST** have written authorization from either their international student advisor or from the U.S. Immigration and Naturalization Service **BEFORE** beginning to work off-campus. Students who start work without authorization lose their student status and are unable to apply for reinstatement of status from within the United States!

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## PRACTICAL TRAINING

According to the regulations of the U.S. Immigration and Naturalization Service for students with F-1 status, all work-related, educational experience falls into either curricular practical training or optional practical training.

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## CURRICULAR PRACTICAL TRAINING

Practical training is in your field of study and is an integral part of an established curriculum. This may be mandatory or optional cooperative education, internship or practicum. To be eligible for curricular practical training you must have F-1 status, 9 months (3 quarters) of full-time study completed in the USA, and the work experience must be in your field of study as part of your established curriculum.

As soon as an offer of employment is accepted, but at least one week before employment begins:

1. Register for co-op through your academic department.
2. Make appointment to see your foreign student advisor to obtain work authorization. Bring your I-20 and offer of employment to the appointment.

You may be authorized for whatever amount of curricular practical training your degree requires; however, you will be ineligible for optional practical training at the end of your studies if you have been authorized for more than 364 days of curricular practical training.

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## OPTIONAL PRACTICAL TRAINING (OPT)

Practical training is in the field of study and can occur during the student's annual vacation; part-time during the academic year; after completion of all course work but before completion of a thesis or project for graduate students; or upon completion of a degree. You must have completed 9 months as a full-time student in the U.S. to be eligible for off-campus work authorization. You must obtain employment in your field of study, have F-1 status, and have completed at least one academic year of full-time study to be eligible. A total of twelve months of optional practical training is allowed for F-1 students.

1. See your foreign student advisor to obtain necessary forms and complete the necessary recommendation.
2. Apply to the U.S. Immigration and Naturalization Service, in writing, for the specific time of employment. The INS fee is \$100. Photographs necessary for the application can be obtained locally for about \$15. The processing time can take up to two or three months for the card to be issued. It is important to apply well in advance of the time that you will need the card as you cannot begin employment until you actually have the card.

Part-time optional practical training (OPT) is available prior to completion of studies as well.

If you wish to apply for optional practical training (OPT) to begin upon completion of your degree, you may apply up to 120 days before you complete all of the requirements for your degree and up to 60 days after you have finished. Upon graduation, you may apply for any amount of your remaining optional practical training you wish. After graduation you have 14 months to complete 12 months of OPT.

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## OTHER TRAINING

For students with J-1 Visas: Regulations for off campus employment differ from those for students with F-1 Visas. Please see one of the international student advisors to obtain information on authorization for co-op or work authorizations after graduation. Students on J-1 Visas must have written authorization to work off campus.

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## WORK AFTER GRADUATION

If, after graduation, you plan to reside in the U.S. on either a temporary or permanent basis, you will want to obtain a temporary working permit (H-1B). Immigration law refers to H-1B workers in "specialty occupations." Specialty occupations include most jobs for which a bachelor's degree in a specific field is a prerequisite for employment. In order to obtain H-1B status, you must first have an offer of employment. There are then specific steps, which the employer must take. You may be in H-1B status for up to six years.

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## FOR MORE INFORMATION

Further information regarding the Immigration and Naturalization Service's policies on employment, federal and state taxes, obtaining a social security number, and special co-op employment needs of international students, consult with International Student Services by phone at 475-6943 or on the mezzanine level of the Student Alumni Union. Work closely with both the Co-op and Career Services office and the International Student Services office before, during, and after your graduate co-op.

M.ENG. PROGRAM OF STUDY FORM

Student Name: \_\_\_\_\_ Entry Term: \_\_\_\_\_

ID # : \_\_\_\_\_ 7 Year Limit: \_\_\_\_\_

Advisor Name: \_\_\_\_\_

**Core courses**

Term	Grade	Number	qcr	Course Name	
_____	_____	0304-870	4	Mathematics for Engineers I	
_____	_____	0304-871	4	Mathematics for Engineers II	Math II is Required for students completing after August 2013
_____	_____	0304-823	4	Systems Modeling	
_____	_____	0304-865	4	Computer Implementation	
_____	_____	<b>One of:</b>	4	Required Graduate Capstone. Select one of the following options:	
		0304-701	<input type="checkbox"/>	Research Methods +	
		0304-730	<input type="checkbox"/>	Design Project Management ++	
		0304-877	<input type="checkbox"/>	Graduate Internship +++	
		0304-888	<input type="checkbox"/>	Project with Paper ++++	

**Focus Area:** \_\_\_\_\_

Term	Grade	Number	qcr	Course Name	
_____	_____	_____	4	Focus Area Course 1 ***	
_____	_____	_____	4	Focus Area Course 2 ***	
_____	_____	_____	4	Focus Area Course 3 ***	
_____	_____	_____	4	Focus Area Course 4	

**Graduate Elective Courses<sup>+++</sup>**

Term	Grade	Number	qcr	Course Name	
_____	_____	_____	4	Grad Elective (0304-600 or higher) *, **	
_____	_____	_____	4	Grad Elective (0304-600 or higher) *, **	
_____	_____	_____	4	Grad Elective (0304-600 or higher) *, **	

**48 Total Quarter Credits for M. Eng. Degree Completion**

**Foot Notes:**

- \* Up to three technical electives 0004-6xx from Mechanical Engineering may be used towards the M.Eng. Degree
- \*\* Students in the BS/Meng Program may double-count no more than 12 QCH credits towards both degrees.
- \*\*\* Up to three graduate level classes from outside of the department may be used, with prior approval from the department head.
- + Students considering the MS program may take 0304-701 Research Methods to prepare a thesis proposal.
- ++ Students in the BS/MEng Program must take 0304-730 Design Project Management, and assume a leadership position on an SD Team
- +++ Graduate Internship is typically for part-time students who are full-time employees of a company.
- ++++ Project With Paper is the typical capstone for Full-Time M.Eng. Students

## M.ENG. APPLICATION FOR DEGREE

A degree application form is shown in the Figure below. Please make sure you submit this form at least two quarters prior to your last quarter of enrollment!

The image shows a form titled "R-I-T APPLICATION FOR GRADUATION" from Rochester Institute of Technology. The form includes fields for Student ID Number, Name (Last, First, Middle, Suffix), Degree type (Bachelor's, Master's, Ph.D.), Program Code, Graduation Date, and Home Address. It also has a section for the Registrar's Office Use Only, including Date Received, Date Processed, and Processed By. The form is distributed by Paykale, Rev-05/11.

Two academic quarters prior to your anticipated degree completion, each student should prepare and submit an application for degree form. These forms are available in the Mechanical Engineering Department office. Please note that you need to fill out one form for every degree you will be completing, if you happen to be working on multiple degrees.

## M.ENG. DEGREE COMPLETION CHECKLIST

- Complete all degree requirements in accordance with the Program of Study
- File all Institute and Departmental Forms, such as the Degree Application Form
- Turn in all departmental keys and equipment
- Clear all accounts at the Student Financial Service's office
- Return all books to the library
- Return all books and materials you borrowed from professors!
- Interns Only:** Submit a brief (2-3 page) report of your duties and responsibilities at the conclusion of your internship to the M.E. Office
- Interns Only:** Submit student internship evaluation form to the M.E. office.
- Interns Only:** Submit employer internship evaluation form to the M.E. office.
- Complete your capstone requirement. The concentration of study in an area of 16 credits, combined with a course with significant design content, a project with paper, or an internship is considered to satisfy the capstone requirement. Students in the BS/MEng program satisfy the capstone requirement through the concentration plus a leadership position on the senior design team.
- DEGREE CERTIFICATION.** Degrees are certified by the registrar four times per year, following the conclusion of each academic quarter. The registrar will send notification of official degree status to your official mailing address upon completion.

## TYPICAL PROGRAMS OF STUDY FOR THE M. ENG. DEGREE

The Master of Engineering Degree is designed to be flexible in the way it is completed. Thus, it is difficult to project the various scenarios by which a student may choose to complete the program. The tables below illustrate possible approaches to completing the degree. **Please note that full time Master of Engineering students who are being supported on a departmental graduate teaching assistantship (GTA) are expected to complete at least 12 quarter--credits during each quarter that they are on a GTA assignment.**

Table 3.7.1 illustrates how a student may choose to complete the M.Eng. degree in 12 calendar months, by completing the project with paper for their graduate capstone.

**Table 3.7.1 Typical Program of Study for a full-time Master of Engineering Student, course only option.**

Fall	Winter	Spring	Summer
0304-870 Math 1	0304-823 Systems Modeling	0304-865 Computer Implementation of FEM	0304-888 Project w Paper (Grad capstone)
Grad Elective 1	Grad Elective 2	Grad Elective 3	Grad Elective 4
Grad Concentration 1	Grad Concentration 2	Grad Concentration 3	Grad Concentration 4

Table 3.7.2 illustrates how a full-time student may choose to complete the M.Eng. degree, with completion of two quarters of co-op work experience in an off-campus job, followed by one-year practical training (OPT) work experience. This approach may be appealing to international students who wish to gain exposure to industrial experience and training in U.S. industries. International students must complete at least nine months of academic study prior to their first off-campus graduate co-op, and may complete no more than two graduate co-ops during their M.Eng. degree program. International students must work closely with the international student programs office on campus to insure that they comply with all Visa and immigration restrictions.

**Table 3.7.2 Typical Program of Study for a full-time Master of Engineering Student, who wishes to complete two quarters of graduate co-op experience.**

Fall – First Year	Winter – First Year	Spring – First Year	Summer – First Year
0304-870 Math 1	0304-823 Systems Modeling	0304-865 Computer Implementation of FEM	Graduate Co-op Experience (no academic credit)
Grad Elective 1	Grad Elective 2	Grad Elective 3	
Grad Concentration 1	Grad Concentration 2	Grad Concentration 3	
Fall – Second Year	Winter – Second Year	Spring – Second Year	Summer – Second Year
Graduate Co-op Experience Continued (no academic credit)	Grad Concentration 4	Begin One-Year Practical Training Work Experience	Continue One-Year Practical Training Work Experience
	Grad Elective 4		
	Grad Capstone		

Table 3.7.3 illustrates how a part-time student may choose to complete the M.Eng. degree, while working at a local company on a full-time basis. Many part-time students elect to take two courses during the fall, winter, and spring quarters, and not take any classes during summer. Other students choose to maintain a steady pace of one course per quarter, and may take an additional year if they choose not to complete classes during the summer quarter, or periods requiring extensive work-related travel.

**Table 3.7.3 Typical Program of Study for a part-time Master of Engineering Student, working full-time off campus, and taking a limited course load.**

<b>Fall – First Year</b>	<b>Winter – First Year</b>	<b>Spring – First Year</b>	<b>Summer – First Year</b>
0304-870 Math 1	0304-823 Systems Modeling	0304-865 Computer Implementation of FEM	Grad Elective 1
<b>Fall – Second Year</b>	<b>Winter – Second Year</b>	<b>Spring – Second Year</b>	<b>Summer – Second Year</b>
Grad Concentration 1	Grad Concentration 2	Grad Concentration 3	Grad Elective 2
<b>Fall – Third Year</b>	<b>Winter – Third Year</b>	<b>Spring – Third Year</b>	<b>Summer – Third Year</b>
Grad Concentration 4	Grad Elective 3	Grad Elective 4	Graduate Capstone

The Master of Engineering degree program is intended to be flexible and meet the needs of a wide range of students. Please do not assume that the programs illustrated here are the only paths to completion of your Master of Engineering Degree.



## ACADEMIC STATUS

### ACADEMIC HONESTY POLICY

RIT is committed to the pursuit of knowledge and the free exchange of ideas. In such an intellectual climate it is fundamentally imperative that all members of this academic community behave in the highest ethical fashion possible in the manner by which they produce, share, and exchange this information. In the case of students, Academic Honesty demands that at all times student work be the work of that individual student, and that any information which a student uses in a work submitted for evaluation be properly documented. Any violation of these basic standards constitutes a breach of Academic Honesty and hence becomes Academic Dishonesty.

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#### KATE GLEASON COLLEGE OF ENGINEERING HONOR PRINCIPLE

*“RIT Engineering faculty, staff and students are truthful and honorable, and do not tolerate lying, cheating, stealing or plagiarism”*

All members of our community are expected to abide by these principles and to embrace the spirit they represent. We each have a responsibility to address any unethical behavior we observe; either through direct discussion with the offending party, or by discussion with an appropriate faculty or staff member. Allowing unethical behavior to continue unchallenged is not acceptable.

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#### KATE GLEASON COLLEGE OF ENGINEERING ACADEMIC HONESTY POLICY

The College of Engineering has set a high standard of academic excellence for the students we serve. Our goal is to prepare students as highly skilled and talented engineers by providing a quality education which includes lectures, laboratory experience, and exams. It is for this reason that the College of Engineering has adopted the following academic honesty policy.

Rochester Institute of Technology does not condone any form of academic dishonesty. Any act of improperly representing another person's work as one's own is construed as an act of academic dishonesty. These acts include but are not limited to plagiarism in any form, including the use of all or parts of computer programs created by others, or the use of information and materials not authorized by the instructor during an examination.

If a faculty member judges a student to be guilty of some form of academic dishonesty, the student may be given a failing grade for that piece of work or for the course, depending upon the severity of the misconduct.

If the student believes the action taken by the instructor to be incorrect or the penalty too severe, appeal may be made to the Academic Conduct Committee of the college in which the course is offered.

This KGCOE policy is intended to apply to all academic pursuits at RIT, including courses taken outside of the KGCOE (with additional adherence to the policies of the relevant academic unit).

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#### ACADEMIC DISHONESTY

Academic Dishonesty falls into three basic areas: cheating, duplicate submission and plagiarism.

1. **CHEATING.** Cheating is any form of fraudulent or deceptive academic act, including falsifying of data, possessing, providing, or using unapproved materials, sources, or tools for a work submitted for faculty evaluation.
2. **DUPLICATE SUBMISSION.** Duplicate submission is the submitting of the same or similar work for credit in more than one course without prior approval of the instructors for those same courses.
3. **PLAGIARISM.** Plagiarism is the representation of others ideas as one's own without giving proper credit to the original author or authors. Plagiarism occurs when a student copies direct phrases from a text (e.g. books, journals, internet) and does not provide quotation marks, or paraphrases or summarizes those ideas without giving credit to the author or authors. In all cases, if such information is not properly and accurately documented with appropriate credit given, then the student is guilty of plagiarism.

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## CONSEQUENCES OF ACADEMIC DISHONESTY

Any act of Academic Dishonesty will incur the following possible consequences. After notifying and presenting the student with evidence of such misconduct, the instructor has the full prerogative to assign an "F" for the offense, or to assign an "F" for the entire course. The instructor will inform the student (and if possible meet with the student) of the decision reached on the "F" for the offense, or the "F" for the entire course. A student may be brought before the Academic Conduct Committee of the College in which the alleged offense occurred, and may face academic suspension or dismissal from the Institute. The Student has the right to appeal any disciplinary action. Note that students must remain in good academic standing to participate in co-curricular clubs and activities in the ME Department. Graduate students must remain in good academic standing to be eligible for graduate assistantships, graduate tuition remission, and graduate merit scholarships.

## ACADEMIC PROBATION RULES

1. Any graduate student whose program quarterly grade point average falls below a 3.00 or whose cumulative grade point average in the principal field of study (based on at least 12 credit hours attempted in the principal field at RIT) falls below 3.00 will be placed on probation.
2. Any graduate student who has been placed on probation according to Rule 1 is removed from probation for achievement of both a 3.00 quarterly GPA and a 3.00 Cumulative GPA in the principal field of study, (based upon at least 24 credit hours attempted in the principal field at RIT).

## ACADEMIC SUSPENSION RULES

1. A graduate student who has been placed on probation, and is not removed from probation in the two succeeding periods of study in which credit is earned, will be suspended from RIT.
2. Any graduate student who has been placed on probation after having been removed from probation and whose program cumulative grade point average is below 3.00 will be suspended. Any student who has been placed on probation after having been removed from probation and whose program cumulative grade point average is 3.00 or above will be granted one quarter to be removed from probation or he/she will be suspended from RIT.
3. Any graduate student whose program quarterly grade point average falls below 2.00 will be suspended from RIT.

4. Any graduate student who has been readmitted to his or her original program after having been suspended, and is placed on probation for a second time, will be suspended from RIT.

A student may petition the department for reconsideration of suspension. To do this, he/she must write a letter to the department head, Professor Hensel, requesting a waiver of the suspension, explaining the circumstances that led to the suspension and detailing how his or her performance in the future will lead to academic success. Students enrolled in the dual degree programs (BS/ME or BS/MEng) program who are placed on probation may be dis-enrolled from the dual degree program, and reinstated in the single BS degree program.

## RIT GRADING POLICIES

### RIT GRADE DEFINITIONS

For each degree or diploma credit hour, the following number of quality points will be awarded based upon the grade received and will be calculated in the current term (quarter or semester) and cumulative grade point averages (GPA):

<u>Grade</u>	<u>Quality Points</u>
A-Excellent	4
B-Good	3
C-Satisfactory	2
D-Minimum Passing	1
F-Failure	0

There are nine other viable evaluations of a course, which do not affect GPA calculations. Only I, R and S can be assigned by individual faculty members at the end of a quarter. The following descriptions provide a brief explanation. The official policy manuals and the catalog contain exact policies and procedures.

- R means Registered, and is generally used for graduate level thesis work.
- I means Incomplete. This grade is given where the professor observes conditions beyond the control of the student such that the student is not able to complete course requirements in the given quarter. This is a temporary grade which reverts to an 'F' grade if the registrar's office has not received a 'Change of Grade' form from the professor by the end of the second succeeding quarter. Professors generally require the completion of the work in a much shorter time period, however.
- W means official withdrawal from course(s) between weeks 2 and 8.
- Z means Audit, indicating a student has audited a course. Audited courses do not count toward the residence requirement.
- S means Satisfactory. This applies only to acceptable completion of the co-operative work experience, P.E. Courses, courses bearing course numbers of 099 or below and internships. These courses and co-op work experience do not count toward the residency requirement.
- X means Credit by Examination or Credit by Experience, assigned for the successful completion of various external or Institute examinations provided such examinations cover or parallel the objectives and content of the indicated course. Often times, students will earn an X grade for credit awarded due to AP courses taken in high school before entering RIT.

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## AUDITING COURSES

When you audit a course, you do not earn any credit. This means only that the student has attended a given course. A grade of 'Z' will be assigned and the student need not take exams. You must obtain permission to audit a course from the Mechanical Engineering Department before you register. Any changes between credit and audit must be accomplished by the end of the drop/add period. There is a reduced tuition charged for audited courses, unless it is part of a full time load.

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## CHANGING GRADES

Once a faculty member has reported a grade, the grade cannot be changed unless an actual error has been made in computing or recording it. If an error has been made, the faculty member must complete the appropriate form, which after obtaining the appropriate approvals, is forwarded to the Registrar's Office to be entered into the student's official record. Grade changes may take a couple of weeks.

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## WAIVED COURSES

Waived courses are courses eliminated from the list of requirements that a student must take to graduate. Courses are not generally waived for graduate requirements.

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## REPEATING COURSES TO RAISE LOW GRADES

All attempts at that a graduate student takes in completing a course are averaged in to the calculation of the graduate GPA. Graduate students may not use repeated courses to replace an earlier grade, but may use repeated courses to bring the average of the two attempts at the course higher.

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## GRADE EXCLUSION

Graduate students may not exclude grades from their GPA.

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## COURSE WITHDRAWAL

A student may withdraw from a course at any time from the end of the drop/add period until the end of the eighth week of the quarter through RIT's Infocenter. Students are STRONGLY encouraged to meet with their faculty advisor to assess the impact of the dropped course on their overall graduation plan before withdrawing from a course. Unlike a "dropped course" a "withdrawn course" becomes a permanent part of your official academic records and a grade of "W" is recorded on your transcript. It is considered bad practice for graduate students to withdraw from courses.

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## TRANSFER CREDIT

Students may be able to transfer some course credits taken at another accredited college or university. Any questions regarding transferring into Mechanical Engineering from another program at RIT, or transferring credit from another institution, etc. should be directed to Department Head, Dr. Hensel. When you wish to take a course at another university

or college while you are away from RIT, check with Dr. Hensel before registering for such a course regarding the transferability of credits. A grade of 'C' or better is required to qualify for transferring the credits for the course. Please note that the course itself is transferred, but the grade is not. Thus, taking a course at another institution will help you complete degree requirements, but will not increase or decrease your RIT GPA.

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## LEAVE OF ABSENCE/INSTITUTE WITHDRAWAL

A full-time student may withdraw from all courses in a quarter by taking a Leave of Absence or withdrawing from RIT (Institute Withdrawal).

A **Leave of Absence** should be filed by students who are withdrawing from all classes in a quarter, but who intend to return to study at RIT within five quarters. This will commonly be done for students facing illness or needing personal leave.


An **Institute Withdrawal** should be filed by students who are withdrawing from all classes in a quarter, and do not intend to return to RIT. Students must apply for readmission if they wish to return to RIT.

Generally, we recommend that students file a Leave of Absence rather than an Institute Withdrawal so that they can return to RIT more easily if they need to. A leave of absence cannot extend beyond five quarters (including summer quarter,) of the quarter in which the student was most recently registered. If a longer period is needed, the student should withdraw from the Institute and re-apply through the Admissions Office when appropriate. A leave-of-absence student failing to re-register in the quarter expected will be placed in the inactive file. (or on the inactive list) which one sounds better?

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## LEAVING CAMPUS FOR MILITARY SERVICE

Students who have to leave campus for military service may have special considerations. Please contact the ME department office if you have to leave campus due to military service obligations. We will be happy to work with you during your deployment, and to provide assistance with your transition back to campus upon your return.



## MECHANICAL ENGINEERING STUDENT ORGANIZATIONS

### **Pi Tau Sigma**

Pi Tau Sigma is the mechanical engineering national honor society. Membership, by invitation, is open to men and women ranked in the upper third of the class in their fourth and fifth years at RIT. Chapter activities are tailored to foster high ideals in the engineering profession, support departmental activities, and promote professionalism. Service activities are supported by fund-raising and social events. Professor Walter is the advisor.

### **Tau Beta Pi**

This national engineering honor society was founded to mark in a fitting manner those who have conferred honor upon their Alma Mater by distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering, and to foster a spirit of liberal culture in engineering colleges. Election to Tau Beta Pi is one of the highest honors that can come to an engineering student from his or her peers. Professor Nye is the advisor.

### **American Society of Mechanical Engineers [ASME]**

The student chapter of ASME offers educational, technical, and social activities. It develops leadership skills and leads to contacts with engineers in industry and students at other colleges within the region. The student chapter is active and works closely with the senior section in Rochester. The faculty advisor is Professor Timothy Landschoot.

### **Society of Automotive Engineers [SAE] and FSAE Competition Team**

The purpose of the RIT Society of Automotive Engineers is to give students the opportunity to meet with senior engineers in industry and provide students a chance to apply their classroom knowledge in various projects. The faculty advisor is Dr. Nye.

### **Society of Women Engineers [SWE]**

The Society of Women Engineers at RIT is a student-run organization. SWE organizes several functions each quarter such as guest speakers, high school outreach, community activities, tours, social events and events with other student organizations. The RIT chapter is strongly committed to the encouragement of women in pursuing a career in engineering or related fields. The faculty advisor is Professor Lam.

### **Society of Hispanic Professional Engineers [SHPE]**

The Society of Hispanic Professional Engineers is an association of professionals and students in engineering, science, technology, business and other related disciplines at RIT. SHPE's basic thrust is to identify and promote professional growth opportunities for Hispanics. The advisor is Rohan Palma.

### **National Society of Black Engineers [NSBE]**

The student chapter of the National Society of Black Engineers is dedicated to the retention, recruitment, and successful graduation of its members. The advisor is David Watson.

### **Aero Design Club**

The student chapter is dedicated to promoting careers and opportunities in the aerospace industry. The faculty advisor is Dr. Jason Kolodziej

## MECHANICAL ENGINEERING CONTACT INFORMATION

### MECHANICAL ENGINEERING ADVISING

The Mechanical Engineering Department views academic advising as an essential component of the undergraduate experience. Students are assigned a faculty advisor (listed on the Student Information System (SIS) as the first advisor) and a staff advisor (listed on the Student Information System (SIS) as the second and/or third advisor) to every student to assist with academic, social and professional needs.

Your faculty advisor is your first point of contact for anything that is related to the mechanical engineering field. You should see your faculty advisor for assistance with course selection, co-ops, course content or career choices. Faculty are available during posted office hours and by appointment to discuss your advising questions. Each faculty member is an engineer, and they can help you to put some professional perspectives on your academic studies. In particular, your faculty advisor can help you select the appropriate technical electives and options that will help you achieve the personal and professional goals that you have established for yourself. Your faculty advisor has been through the courses you are taking, and may be able to suggest study skills and approaches to help you be successful. If you experience any problems related to your coursework, remember that the best time to see your advisor is before problems get big, so that the two of you can decide on a course of action to solve them while they are more easily manageable.

Your staff advisor is responsible for providing resources for faculty advisors and implementation of the overall advising program for the department. You should see your staff advisor if you need assistance with course scheduling, academic performance issues, learning community schedules, transfer credit or life at RIT. The staff advisors are not engineers, but they understand the RIT registration processes and degree completion requirements. Staff advisors can often answer most logistical questions that you may encounter related to registration. Staff advisors are not in a position to provide technical advice on specific courses, or how those courses may relate to your professional career opportunities. Staff advisors are well aware of the various resources available around the campus, and can help you connect with study centers and assistance resources of both an academic and personal nature.

### MECHANICAL ENGINEERING STAFF POINTS OF CONTACT

Edward Hensel is the Department Head of Mechanical Engineering. He is responsible for the overall direction and management of the department and its programs in Rochester and Dubai. Dr. Hensel supervises all faculty and staff in the department, manages all cases of academic misconduct in the ME department, and also is responsible for recognitions of outstanding performance.

Alan Nye is the Associate Department Head for outreach and experiential learning. He is responsible for all transfer students, 2/3 students with combined study between two campuses, and all questions related to change of program in to and out of mechanical engineering. Dr. Nye manages the spring accepted student open houses, RIT First Look, and transfer student open house. Dr. Nye regularly meets with prospective students who are considering RIT as their destination for study. Dr. Nye oversees the co-operative education program and must approve any co-op opportunity not listed through job-zone. Dr. Nye is in charge of the study abroad program in mechanical engineering, and can help you with any question you may have about studying at our RIT Dubai campus, or another location. Dr. Nye manages the AP articulation, Project Lead the Way, International Baccalaureate, and transfer credit evaluation for incoming freshman.

Risa Robinson is the Associate Department Head for undergraduate education. She manages the core undergraduate course offerings in mechanical engineering and also serves as the coordinator for the Engineering Science Core Curriculum. Dr. Robinson is responsible for all outcomes assessment and accreditation issues in the department. Dr. Robinson manages the fall prospective student open houses.

Diedra Livingston is the Mechanical Engineering Student Services Coordinator. She oversees first and second year programs for the Mechanical Engineering Department and works closely with faculty advisors to help student stay on track for the completion of their degree. Diedra work closely with Diane Selleck, the ME Student Information Specialist. Sherill Anderson is a staff advisor in the ME department. Diane maintains graduate and undergraduate student records and is responsible for data entry related to registration. Between Diedra, Diane, Sherill and your faculty advisor, you should be able to find an answer to almost any degree completion question that you may have. Diedra coordinates the Mechanical Engineering Learning Communities and registration and advising for first and second-year students.

Venessa Mitchell is the Mechanical Engineering Administrative Financial Service Coordinator. She maintains the financial records for the mechanical engineering department. She provides departmental budget information and tracks all students employed in our department. Venessa works with all faculty members who hire students for their classes and labs, all purchasing related to student clubs, and purchasing related to research projects. If you have a question about anything financial, Venessa is your point of contact.

David Hathaway the Mechanical Engineering Operations Manager, assisted by Rob Kraynik and Jan Maneti is responsible for maintenance and repair of the equipment in all of our labs. Dave supervises the student technicians who work in the Machine Shop and PC Lab and he is responsible for all use of the machines in the shop area. Before any project work is done in the Machine Shop, please see Dave. Dave, Rob, and Jan teach materials processing labs and will work with you on prototypes and fabrication throughout your academic careers.

William Finch is the Systems Administrator for the Department. He is in charge of the ME computer labs, their maintenance and upkeep. Bill also is the supervisor for the lab assistants who work in the computer labs.

Every mechanical engineering student has a mail folder outside the Mechanical Engineering Office. Any messages for you will be placed in your mail folder. Memos from the Co-op Office, Mechanical Engineering Office, Dean's Office, instructors, and general information regarding the program will be put into your mail folder. Faculty members may hand papers back to your mail folders. Important notices and information will be posted above the mail folders. **YOU SHOULD CHECK YOUR MAIL FOLDER REGULARLY IN ORDER TO RECEIVE INFORMATION IN A TIMELY MANNER.**

All faculty members have their own mailboxes, and the ME office staff will deliver information from you to the faculty mailboxes. If you have any messages for your faculty member, want to submit late homework assignments, etc., please hand submit them to the front desk in the Mechanical Engineering office and have it date stamped, *unless instructed otherwise by your professor*. Make sure that the instructors' name and your name are clearly visible so that your paperwork is filed in the correct mailbox.

## MECHANICAL ENGINEERING FACULTY AND STAFF DIRECTORY

Mechanical Engineering Faculty and Staff	RIT ext.	Bldg/Room	E-mail
M.E. Office Front Desk	55181	09/2103	meche@rit.edu
Dr. Edward Hensel, Dept. Head	57684	09/2103	ECHEME
Dr. Alan Nye, Assoc. Dept. Head	56121	09/2103	AHNEME
Dr. Risa Robinson, Assoc. Dept. Head	56445	09/2103	RJREME
Ms. Venessa Mitchell, Adm/Fin Service Coord.	52162	09/2103	VMMEME
Ms. Diane Selleck, Student Info. Specialist	52163	09/2103	DMSEME
Ms. Diedra Livingston, Student Services Coord.	57489	09/2103	DJLEME
Ms. Sherill Anderson, Advisor		09/2103	
Mr. David Hathaway, Operations. Mgr.	52184	09/2361	DLH6477
Mr. William Finch, Systems Admin.	52964	09/2242	WGFIEE
Mr. Jan Maneti, Sr. Mechanical Tech	57718	09/2361	
Mr. Robert Kraynik Sr. Mechanical Tech	54073	09/2361	RAKEME
Dr. Margaret Bailey	52960	09/2061	MBBEME
Dr. Stephen Boedo	55214	09/2031	SXBEME
Dr. Agamemnon Crassidis	54730	09/2081	ALCEME
Dr. Steven Day	54738	09/2171	SWDEME
Dr. Elizabeth DeBartolo	52152	09/2051	EADEME
Dr. David Gee	54237	17/2543	DJGEME
Dr. Hany Ghoneim	56414	09/2011	HNGEME
Dr. Amit Ghosh	52191	09/2179	ANGEME
Dr. Mario Gomes	52148	09/2189	MWGEME
Dr. Surendra Gupta	52158	09/2071	SKGEME
Mr. Edward Hanzlik	57428	17/3615	ECHEEE
Mr. Bill Humphrey	55628	17/2523	WAHEME
Dr. Satish Kandlikar	56728	09/2001	SGKEME
Dr. Mark Kempksi	52473	09/2091	MHKEME
Dr. Jason Kolodziej	54313	09/2132	JRKEME
Dr. Margaretha ( Marca ) Lam	56871	09/2191	MJLEME
Dr. Kathleen Lamkin-Kennard	56775	09/2185	KALEME
Mr. Tim Landschoot	57439	09/2134	TPLEME
Ms. Kate Leipold	55372	09/2136	KNLEME
Mr. Alexander Liberson	56672	17/3605	ASLEME
Dr. Ali Ogut	52542	09/2015	ADOEME
Dr. Risa Robinson	56445	09/2041	RJREME
Dr. Michael Schrlau	52139	09/2181	MGSEME
Dr. Frank Sciremammano	56819	09/2021	FNSEME
Dr. Robert Stevens	52153	09/2167	RJSEME
Dr. Benjamin Varela	54737	09/2012	BXVEME
Dr. P. Venkataraman	56975	09/2175	PNVEME
Dr. Wayne Walter	52925	09/3213	WWWEME
Mr. John Wellin	55223	09/2014	JDWEME

# APPENDIX A. M.ENG. BRIDGE COURSES FOR STUDENTS WITH A BS ME TECH DEGREE

Qtr.	Grade	Number	Cr	Name	Qtr.	Grade	Number	Cr	Name
MET	X	0301-381	(4)	Circuits I with Lab	Req*		(4)	1016-261/271/281	Calculus
MET	X	0304-203	(1)	Freshman Seminar	Req*		(4)	1016-272/282	Calculus B/II
MET	X	0304-214	(2)	Eng. Design Graphics Lab	Req*		(4)	1016-273/283	Calculus C/III
MET	X	0304-261	(2)	Cornerstone Des. Proj. Lab					
Req		0304-280	(2)	Meas. Instrum. & Control Lab					
Req		0304-336	(4)	Statics					
MET	X	0304-342	(3)	Prob. Solving w/ Comp. Lab					
MET	X	0304-343	(3)	Materials Processing, Lab					
MET	X	0304-344	(4)	Materials Science, Lab					
Req		0304-347	(4)	Mechanics of Materials					
MET	X	0304-348	(1)	Mechanics of Materials Lab					
Req		0304-359	(5)	Dynamics					
Req		0304-413	(4)	Thermodynamics					
Req		0304-415	(4)	Fluid Mechanics					
MET	X	0304-416	(1)	Thermal Fluids Lab I					
Req		0304-437	(4)	Design of Machine Elem.					
Req		0304-440	(4)	Numerical Methods					
Req		0304-514	(4)	Heat Transfer					
Req		0304-518	(4)	Adv. Comp. Tech., Lab					
Req		0304-543	(5)	System Dynamics					
Req		0304-550	(4)	Transport Phenomena					
MET	X	0304-551	(1)	Thermal Fluids Lab II					
Req		0304-630	(4)	Senior Design I					
Req		0304-631	(4)	Senior Design II					
Req		0304-6	(4)	Tech. Elec. I					
Req		0304-6	(4)	Tech. Elec. II					
Req		0304-6	(4)	Tech. Elec. III					
Req		0304-6	(4)	Tech. Elec. IV					
<b>NOTES:</b>									
(94) Total Engineering Topics									
(49) Total Liberal Arts & Free Electives									
<b>(195) TOTAL CREDITS</b>									

\* Students must complete ME math and physics sequence. Placement in courses based upon past work completed.

## APPENDIX B. ADVICE TO GRADUATE STUDENTS

### ADJUSTING TO GRADUATE STUDIES

You are expected to be an independent professional. Graduate study in engineering is intended to be a different kind of experience from the undergraduate program of study. Most students enrolled in an undergraduate engineering program follow a highly structured sequence of courses in a relatively common fashion. Undergraduate courses consist of homework, reading, projects, and final exams. Graduate courses have many of the same elements, but it is expected that the student is much more independent than they were as an undergraduate student. The graduate program has much more flexibility to allow you to select courses of interest. Use this flexibility to design a personalized program of study that advances your career aspirations.

You are expected to do every graduate homework assignment on time. You will find that your graduate homework problem sets require you to expand your knowledge beyond the topics that were covered in class. In contrast, most undergraduate homework problem sets were designed to help you practice and master the topics covered during the classroom session. Thus, homework problem sets are an even more important aspect of your graduate program. As an undergraduate student, you might have been late in submitting homework assignments, or during a busy week have not even completed the homework assignment because homework was a relatively small portion of the course grade. As a graduate student, homework may still be reflected as a small portion of the course grade, but it is a more critical element of the learning experience. Handing in your homework late (even by an hour) is taken by many faculty members as a sign that you may not really be serious about your graduate studies. Do not procrastinate. Begin work on every assignment the day that you get it.

You are expected to do your graduate homework independently. As an undergraduate student, it may have been common for you to work in groups to complete a large set of small problems. As a graduate student, you will typically have fewer problems in an assignment, but each problem is more significant in scope. You are expected to do these problems alone. If your faculty member permits collaboration on homework, then you **MUST** cite your collaboration in your written homework submission, and be very clear about your contributions and those of your peer students. Failure to provide citation is considered plagiarism. By default, you should assume that every task of every graduate class is intended to be completed as an individual effort, unless you are explicitly informed otherwise by the faculty member teaching the course.

You are expected to keep pace with the class. The faculty members assume that you read the material assigned, and that you understand what you have read to a level that you are able to apply what you have learned. It is not sufficient to read the textbook casually, you are expected to understand every word of every sentence. If you do not understand the readings, then you should seek help. Your faculty member will be willing to help you, but they expect you to come prepared with very specific questions. You should not approach a faculty member with a general statement that *"I do not understand Chapter 1."* Instead, you should pinpoint exactly where the confusion is. For example: *"I do not understand how the author moved from Equation 1.1 to 1.2. Here is the work I have done to try to understand the author. Would you please help me understand what I am missing?"* is the type of question expected from a graduate student.

You are expected to be a role model. Undergraduate students look up to you. You are expected to behave with the utmost professionalism and academic conduct at all times. You are an engineer first, and a student second.

## GRADUATE STUDENT SUPPORT

The mechanical engineering department is fortunate to be able to provide significant financial support to many graduate students as they pursue their studies. The most common forms of support are listed here.

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### GRADUATE MERIT SCHOLARSHIP

Graduate merit scholarships may be provided to students based on outstanding academic performance. Merit scholarships are highly competitive, and limited in number. Graduate students must maintain a GPA over 3.0 in order to qualify for earning a merit scholarship. However, because of the competitive nature of the merit scholarships, most recipients have historically maintained a GPA of 3.75 and higher. Merit Scholarships are for one academic term at a time, and may be renewed with continued outstanding academic performance. Merit scholarships do not require any work for the department by the student. Dual degree students may maintain their scholarship support as they continue their graduate studies.

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### GRADUATE TEACHING ASSISTANTSHIP

Graduate teaching assistantships (GTA) are a form of salaried employment in the department. A GTA may be provided to students who are doing very well academically, and who can provide meaningful support to the department. Graduate students must maintain a GPA over 3.0 in order to qualify for a GTA. Most GTAs require the graduate student to work for the department at a rate of nominally 20 hours per week including all weeks that classes are in session, finals week, and the break week between academic terms. Students who are employed on a 20 hour per week GTA are eligible for a 50% tuition remission. Students who are employed on a 10 hour per week GTA are eligible for a 25% tuition remission. Dual degree student should note that tuition remission may replace (not add to) certain scholarships you may already be receiving. Dual degree students must be at year level 6 to qualify for a GTA. GTA appointments are for one academic term at a time, and require positive work evaluation by the supervising faculty member and continued good academic standing by the student. GTA appointments are generally not available for more than one full academic year for Master's students. Students on a 20 hour per week GTA are not eligible for other employment or GRA support, on-campus or off-campus. Students on a GTA must be full-time students.

**Please note that full time graduate students who are being supported on a departmental graduate teaching assistantship (GTA) are expected to complete at least 12 QCH during each quarter that they are on a GTA assignment. Dual degree students being supported on a GTA are expected to complete at least 16 QCH (consisting of both undergrad and graduate courses) during each quarter that they are on a GTA assignment. It is very important to understand that GTA's are not usually offered for a second year of study.**

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### GRADUATE RESEARCH ASSISTANTSHIP

Graduate research assistantships (GRA) are a form of grant-in-aid of research, often from an external sponsor. A GRA is not considered employment, but rather financial support of a student's research. The GRA is not intended to compensate a student for all hours spent working on their thesis research, but is intended to partially defray the student's cost of attendance, in order to allow them to focus more time and effort on their research. A GRA may be provided to students who are doing very well academically, and who are pursuing research of interest to a faculty member and their sponsor. GRA awardees must understand that GRAs are extremely competitive, and that GRAs play an important role in maintaining a positive relationship with research sponsors. Graduate students must maintain a GPA over 3.0 in order to qualify for a GRA. GRAs require the graduate student to work on their research at a rate of **at least** 20 hours per week

including all weeks that classes are in session, finals week, and the break week between academic terms. Students who are supported on a 20 hour per week GRA are eligible for a 50% tuition remission. Students who are employed on a 10 hour per week GRA are eligible for a 25% tuition remission. Dual degree student should note that tuition remission may replace (not add to) certain scholarships you may already be receiving. Dual degree students must be at year level 6 to qualify for a GRA. GRA appointments are for one academic term at a time, and require positive work evaluation by the supervising faculty member and continued good academic standing by the student. GRA appointees are selected by the supervising faculty member. Students on a 20 hour per week GRA are not eligible for other employment or GTA support, on-campus or off-campus. Students on a GRA must be full-time students.

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## HOURLY EMPLOYMENT

Graduate students may apply for hourly jobs on campus. these jobs require a wide range of duties, and have varying pay scales, depending upon the required skills and duties. Hourly employees must electronically record their time at work, and will report to a work supervisor. Hourly employees are not eligible for tuition remission. Students must be full-time students to be employed as an hourly student, and may be at any year level.

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## GRADUATE FELLOWSHIPS

A graduate fellowship is a highly prestigious form of support, and are highly competitive. The department currently offers the Kelly Graduate Fellowship as a supplement to either a GTA or a GRA, for a highly deserving student. The fellowship is made possible by a gift from the Kelly Family. There are many external fellowship programs that you may consider applying for, outside of RIT. Those fellowship programs have a wide variety of eligibility requirements, and may or may not have a work commitment associated with them.

## COURSE LOADS

A normal full time course load for a graduate student is three courses of four quarter-credit-hours (4 QCH) each per academic term for a total of 12 QCH. Students who are anxious to complete their degree rapidly have been able to take four courses per term (a total of 16 QCH) but typically are not able to hold down any jobs, GTA, or GRA while taking four courses. International students on an F-1 Visa must remain as full time equivalent status (FTE) at all times during their program of study, in order to comply with US immigration rules. FTE is defined as greater than or equal to 12 QCH during every academic term (Fall, Winter, and Spring). Please note that students may use a combination of actual course credits and equivalency to achieve full time status. For example, a student may enroll for 8 course credits (two 4 QCH courses) and be employed as a GTA (20 hours of GTA is treated as 6 QCH of equivalent courses), to achieve 14 Equivalent QCH. Every year, new students arrive at RIT, and are offered a GTA. When the student learns about the equivalency rules, it is common for many students to reduce their course load to 8 QCH and use the 6 equivalent QCH to achieve FTE status. However, it is very important for you to understand that GTA's are not usually offered for a second year of study. Students who complete only six courses during their first year of study are not likely to be awarded a GTA for a second year of study. If you are on a GTA, you should be taking at least three courses (12 QCH) for each of the fall, winter, and spring terms during your first year of study. The vast majority of students begin their program of study as a Master of Engineering Student. Several MEng students express interest in changing to the MS program. The best way for you to accomplish a change of program from the MEng program to the MS program is to take three courses each academic term (fall, winter, and spring), and to complete an MS thesis proposal by May of your first year. Students who have completed nine courses and their thesis proposal while carrying a GTA are viewed as very strong research potential candidates by most faculty members, and are in a very good position to compete for a GRA while working on a thesis. Students who complete only six courses while carrying a GTA and do not complete a thesis proposal are viewed as low research

potential students by most faculty members, and are in a weak position to compete for a GTA renewal or be considered for a GRA. Students who are supported as a GRA during the first year should work closely with their faculty supervisor to confirm that the student is progressing with their course work at the rate expected by the faculty supervisor.

A typical Master of Engineering program of study should take no more than four quarters of study for most full time M Eng students. M Eng students who are moving very quickly and are self-supported may complete the M Eng degree in three quarters. M Eng students who are taking one course at a time while working full time may require four or more years to complete the degree.

A typical full time Master of Science program of study should take three quarters of study to complete all course work requirements, and 12 to 15 months of research work to complete the thesis, for a total program of study ranging from 21 to 24 months. MS Students who are moving very quickly and are self-supported may complete the MS program in 18 to 21 months.

A full time student who takes more than two calendar years to complete a Master's degree is usually considered to be making very slow progress. A full-time program of study lasting more than two years may be viewed negatively by prospective employers.