



DEPARTMENT OF MECHANICAL ENGINEERING

2019-2020 UNDERGRADUATE STUDENT HANDBOOK 09/17/2019

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Welcome to the UK Department of Mechanical Engineering!

This handbook has been prepared to assist mechanical engineering undergraduate students plan a course of study and to keep track of their progress. It is intended to be used only as a supplement to the *University of Kentucky Bulletin*. The *UK Bulletin*, among other important information, contains statements of official academic policy regarding current courses, elective requirements, as well as pre-engineering and engineering standing requirements. The *UK Bulletin* is the authoritative source of information for all undergraduate students.

This handbook should be retained throughout the student's stay in the department, and it should be used in conjunction with priority registration conferences with the student's academic advisor each semester, as well as an aid in planning courses to be taken in the upcoming semester(s).

Most of the courses in the mechanical engineering curriculum are required of all mechanical engineering students. However, there is a certain degree of flexibility provided by elective courses. The courses that offer the student a choice within certain limits are: (1) the UK Core curriculum, (2) the mathematics elective, and (3) the mechanical engineering technical electives. Each area is discussed later in this handbook.

Please keep in mind that while intended to be a helpful resource to students, this handbook is not a substitute for meeting with an academic advisor in ME, nor a replacement for the information found in the *UK Bulletin*. The most updated version of this handbook is available on

the ME website. Students are encouraged to contact their ME advisors whenever they have a question about the program, the college, or the university.

In addition to making steady progress through the ME curriculum, students are encouraged to take advantage of opportunities for student involvement in pre-professional and engineering-related activities offered at the department, college, and university levels. Students should consider participating in those activities to further enrich their academic experience at UK.

The faculty and staff of the Department of Mechanical Engineering look forward to working with you while you pursue your goal of becoming a graduate of UK in mechanical engineering.

ADVISING INFORMATION FOR MECHANICAL ENGINEERING STUDENTS

After ME students have completed their freshman year, academic advising becomes the responsibility of the mechanical engineering department. Each student is assigned to both an academic advisor and a faculty mentor, the names and email addresses of which are posted on a student's myUK account.

As ME majors, all students are welcome and encouraged to meet with departmental advisors and faculty mentors with any questions/concerns regarding the program, the program requirements, opportunities for scholarships, research, and employment.

The *academic advisors* (located within the ME department office suite, 1st floor, RGAN) maintain the departmental records for students and monitor their

progress through the program. They are available to discuss the choices and decisions students may face as they work toward the successful completion of the ME degree. Advisors provide guidance and referral to other resources and services within the department, college, and university. Departmental advisors also provide accurate and timely information regarding academic policies, procedures, and requirements.

Faculty mentors provide additional value and insight to the advising process for ME students. In addition to their academic expertise, the ME faculty is aware of current issues and trends in ME that can be helpful to students' career development. Students may meet with their faculty advisor to discuss a particular class, research opportunities, certifications, career planning, and graduate studies.

Communication

In addition to meetings with an advisor, students can receive relevant information about advising and academic related announcements through the *ME undergraduate list serve*. These periodic emails are meant to contain meaningful and timely information for the benefit of ME students.

Likewise, advisors welcome emails from students who have a quick question or need clarification on an issue. In some cases, advisors may invite the student for an office meeting in order to have a full discussion regarding a particular issue. It is the responsibility of ME students to read **all** ME emails and to stay current with department information.

Priority Registration Advising

[Note: While the primary emphasis on

advising occurs during the priority registration period, students are encouraged to visit their advisor at any time during the semester.]

During the fall semester, advising for priority registration for the upcoming spring term begins prior to October 1st. During the spring semester, advising for the following fall term begins prior to spring break (usually in late February or early March). Timely emails are sent to the ME undergraduate listserv announcing the approaching registration period and the procedures that are to be followed.

All students are required to meet with their departmental advisor prior to being eligible to register for the next semester. Any instructions for making advising appointments during this time will be provided to students prior to the start of priority registration appointments

To prepare for priority registration advising, students are required to use the Course Planner feature of their myUK/myGPS account to plan the next two semesters of courses. It is recommended that courses be planned in conjunction with the Degree Audit feature (myGPS) of myUK. Prerequisites can be verified either via course descriptions in the *UK Bulletin* or in the Course Catalog.

After the advising meeting and formulating an agreed upon plan for the upcoming semester's courses, the advisor will remove the "advising hold," and the student will register via myUK during a pre-determined registration window. Except for extenuating circumstances, students must meet in-person with their academic advisor before the advising hold will be lifted.

THE UK CORE CURRICULUM

The UK Core curriculum is separated into ten areas of study (see below). Mechanical engineering students satisfy some of the UK Core curriculum requirements in conjunction with their major requirements. Typically, a student may satisfy the remaining UK Core requirements with the completion of eight courses outside the mechanical engineering curriculum. (This is the case only if the student completed two years of the same foreign language in a secondary school.)

For mechanical engineering students, the UK Core requirements are to be completed in the following manner:

Intellectual Inquiry – One course in each of the following areas:

- *Arts & Creativity* – Fulfilled by program requirement of EGR 101, EGR 102, and EGR 103. (Transfer students will use EGR 215 in lieu of EGR 101 and EGR 103.)
- *Humanities* – Fulfilled by taking one course from UK Core offerings.
- *Social Sciences* -- Fulfilled by taking one course from UK Core offerings.
- *Physical and Mathematical Sciences* – Fulfilled by program requirement of PHY 231 & 241

Composition & Communication I and II Sequence –

- WRD/CIS 110 and WRD/CIS 111
- WRD/CIS 112

Quantitative Reasoning – One course in each of the following areas:

• *Quantitative Foundations* – Fulfilled by program requirement of MA 113/193

• *Statistical Inferential Reasoning* – Fulfilled by taking STA 210, STA 296 or STA 381

Community, Culture and Citizenship in the USA – Fulfilled by taking one course from UK Core offerings.

Global Dynamics – Fulfilled by taking one course from UK Core offerings.

Foreign Language – two semesters of the same foreign language **or** two years of the same foreign language in a secondary school. Submit a high school transcript to UK Admissions if one is not on file already.

In addition to the UK Core, students must fulfill the university's **Graduation Composition & Communication Requirement (GCCR)**. ME majors accomplish this by taking WRD 204 (Technical Writing).

MECHANICAL ENGINEERING MAJOR PRE-REQUISITES

The mechanical engineering curriculum (see page 11) is organized by courses recommended taken in a particular semester. Certain courses are pre or co-requisites for other courses, and it is important that these course(s) be taken during the proper semester of study. **A delay in taking a pre-requisite course may result in a delay of the student's graduation.**

The student who is "off-schedule" may find that the number of semesters required to complete this program will be determined not by the number of courses needed, but the sequence in which the

courses must be taken.

Note: Pre and co-requisites are enforced rigidly, regardless of the student's major.

REQUIREMENTS FOR ENGINEERING STANDING

To earn engineering standing and be eligible to take upper-division classes, mechanical engineering students must have completed at least 35 semester credit hours applicable to the degree program with a minimum cumulative UK GPA of 2.50. In addition, completion of EGR 101, EGR 102, and EGR 103 (or EGR 215 instead of EGR 101 and EGR 103 if a transfer student), WRD/CIS 111 or WRD/CIS 112 (or ENG 102) CHE 105, MA 113, MA 114, MA 213, PHY 231/241, PHY 232/242, and EM 221 with a minimum GPA of 2.50 in these courses averaged, as well as a C or better in each of these courses.

Students may exercise up to three official University of Kentucky repeat options to improve his/her cumulative grade point average. Students can retake the classes used for the pre-ME GPA of the courses listed above up to three times, and the highest of those three attempts will be used to calculate the pre-ME GPA. Any request for exceptions to these requirements should be submitted to the ME Director of Undergraduate Studies.

Note to Transfer Students: Additionally, it is important to note if you receive acceptance of transfer credit for one or more of the above listed courses, the grades earned will be used in the calculation of the pre-ME GPA necessary for engineering standing.

MATHEMATICS ELECTIVE

The mathematics elective is selected from the following options:

STA 381 – Intro to Engineering Stats
MA/STA 320 – Intro Probability
MA 321 – Intro to Numerical Methods
MA 322 – Matrix Algebra
*MA 416G – Principles of Operations Research I
*MA 432G – Methods of Applied Mathematics I
*MA 481G – Differential Equations I
EGR 537 – Numerical Analysis
ME 585 – Fourier Series & Boundary Value Problems
*These courses are particularly appropriate for students considering graduate study.

TECHNICAL ELECTIVE REQUIREMENT

Students must take nine credit hours from the approved list; a minimum of six credit hours (two courses) must have an ME prefix or be cross-listed as an ME course. A maximum of three credit hours (one course) may be chosen from the courses listed from another COE engineering department.

NOTE: A list of approved ME and non-ME technical electives is provided as an attachment at the end of this document.

For a student to receive permission to take a course not on either of the approved lists, the student will submit a petition -- with justification included -- to the DUS for an exception, which will then be reviewed on a case-by-case basis.

Technical electives are generally taught during a fall or spring term-only basis

and may not be offered every year. Insufficient student enrollment may result in a course not being offered.

GRADUATION REQUIREMENTS

To be eligible for the award of any degree, a student must have completed all requirements as approved by the University Senate. **Curriculum requirements must include, in addition to specified credits, specified grade-point averages – cumulative, pre-major, and major – which may in no case be less than a 2.0 GPA. (See the *UK Bulletin* for specific classes used for the major GPA.)**

The graduating student must file an application for graduation, via a link on myUK or otherwise directed, by the published deadline. The last day to submit the Application for Degree is provided in the official University of Kentucky Calendar.

REPEATED REGISTRATION IN A COURSE

ME policy allows students to take ME and EM classes at UK three times. (“W”s do not count toward attempts.) However, unless an official university repeat option is filed, only the first attempt will count toward a student’s cumulative GPA. (All attempts at EM, ME, and all technical electives will be used to calculate a student’s major GPA, except for courses on which a UK repeat option is filed.)

Please keep in mind that repeated attempts yielding low grades will negatively affect a student’s GPA and may create problems with GPA-related issues, such as earning engineering standing, maintaining scholarships,

avoiding probation/suspension, etc. Be sure to talk to your advisor about any need or plans to repeat a course. Also, when considering whether or not to repeat a course, be sure to review both the University’s and the department’s policies on filing repeat options.

ACADEMIC BANKRUPTCY **(Readmission after Two or More Years away from UK)**

The dean of the student’s college may permit a readmitted student who has elected not to count past work to receive credit for selected courses without including those grades in the computation of the student’s cumulative GPA. This is called academic bankruptcy. Part-time, as well as full-time students can take advantage of the academic bankruptcy rule. Students need not have been originally suspended from the University to qualify for this option. Check with your academic advisor about the qualifications for applying for academic bankruptcy.

How Academic Bankruptcy is applied to ME:

For ME engineering standing, previous grades earned for any of the ME engineering standing courses that have been bankrupted will be used towards the calculation of standing. When courses have been repeated, the best earned grade will be used to calculate the GPA for standing, even if they have been removed from the student’s cumulative GPA.

PLAGIARISM

A note to all students – be sure you

understand the expectations of the university in regard to cheating and plagiarism. Do not assume that a team effort is allowed unless it is clearly indicated in the assignment. A team effort should be indicated clearly in the submission, as well. For a discussion of the overall issue and guidelines, refer to the website for the Ombud of the University of Kentucky.

SPECIAL EXAMINATIONS and BYPASS EXAMS

The chair of the mechanical engineering department approves/denies requests by students to take special examinations or bypass exams.

No special or bypass exam will be approved for courses with laboratory content, group projects, presentations, or design content offered through the Mechanical Engineering Department.

To request a special or bypass exam, begin by checking with the appropriate department or faculty member that a special exam is available, then go to the Registrar's Office (Room 10 Funkhouser Building) and request an "Application for Special Examination" form. Complete the top portion of the form and take the form to your academic advisor for further instructions.

PERMISSION TO RECEIVE CREDIT FROM ANOTHER INSTITUTION (Transfer credit)

[NOTE: Before enrolling at another institution, meet with your ME advisor to insure that the course will transfer and fulfill the intended UK degree requirement, for further details, procedures, and for approval.]

Transferring engineering courses to UK is possible, but certain restrictions apply. Due to ABET accreditation, all ME and EM required courses (with the possible exception of EM 221, ME 220, EM 313 and EM 302) must be taken at an ABET-accredited institution. Permission to receive credit from another institution must be requested and approved *prior* to taking the intended course. Ask your advisor for the proper form and additional information.

Depending on the course and the institution, approval or conditional approval will be granted for either a course equivalency or bypass examination eligibility (see earlier section). It is advised that students collect and save the course syllabus, graded homework and papers, and copies of exams for possible review/evaluation.

Credit hours earned will transfer to UK, although the grade will only be used for calculating engineering standing and a student's major GPA. Grades will not be used in calculating University cumulative GPA.

Once you have completed the course, you must have that institution send an official transcript to UK so that the credit may be applied to your UK record. This should be done as soon as the final grade(s) post on the transfer school's transcript.

Transferred courses must be completed, and credit transferred to UK prior to beginning any classes for which the transferred course is a pre- or co-requisite. Be sure to check with your academic advisor to determine if the course you plan on taking fits these criteria.

Send the official transcript or course information to the UK Office of Undergraduate Admission.

PROFESSIONAL ENGINEER FUNDAMENTALS EXAM (FE EXAM)

Students often inquire about why they should take the FE exam if it is not required for graduation. Students may find that many employers place a premium on licensure and reward it with higher pay; others may require it for more senior level positions. Some types of engineering work require a Professional Engineers License which can only be obtained after successfully completing the FE exam and four years of engineering work experience beyond a Bachelor's from an (EAC/ABET) accredited institution.

Students will register for the FE exam on the National Council of Examiners for Engineering and Surveying website (<http://ncees.org>). For more information, go to the Kentucky State Board of Licensure for Professional Engineers and Land Surveyors at: <http://kyboels.ky.gov/>. The website provides information on the application process for the FE exam.

Students will also take the FE at the Pearson VUE Testing Center in Lexington, as well as at Pearson VUE testing centers in other cities in Kentucky. Students may register for the tests at any time throughout the year through the NCEES website.

COOPERATIVE EDUCATION

Through co-operative education, students obtain transferable skills, such as communication, leadership, presentation, teamwork, and social skills. Students get

a glimpse of "real life" as an engineer, and have the opportunity to be mentored and be introduced to a professional engineering, business or research environment.

Most co-op employers request students to work for a total of three, full-time rotations (semesters and summers), alternating with semesters of study on campus. Many of UK's co-op graduates receive job offers even before receiving their diplomas.

Employers inside and outside of Kentucky participate in this program, and routinely recruit co-op students from UK. About thirty percent of co-ops work outside of the Commonwealth of Kentucky.

EDUCATION ABROAD

The ME department collaborates with the Education Abroad office in order to assure *pre-departure approval of course equivalencies and course bypass examination eligibility*. Meet with your advisor early in the planning process in order to discuss the proper procedure.

THE UNIVERSITY SCHOLAR' S PROGRAM -- COMBINED MASTER' S / BACHELOR' S DEGREE PROGRAM

The University Scholar's Program offers highly motivated undergraduates the opportunity and the challenge of integrating their undergraduate and graduate courses in a single continuous program culminating in both a baccalaureate and master's degree in mechanical engineering.

The University Scholar's program provides students the opportunity to

begin preliminary course and research work for the graduate degree under the direction of a faculty advisor during their senior year.

Other opportunities for similar combined degrees are available in Biomedical Engineering and Manufacturing Systems.

For further information on these programs, check with your advisor.

AEROSPACE CERTIFICATE

The aerospace option in engineering certificate program provides students with a formalized recognition of an emphasis in aerospace subjects as part of their undergraduate degree program.

At UK, as at most universities, the fundamental and applied courses necessary for a career in aerospace engineering are taught in various departments. The UK Aerospace Certificate option will provide students with multidisciplinary experience in aerospace systems and in aerospace specializations, preparing them to join the aerospace workforce.

POWER AND ENERGY INSTITUTE OF KENTUCKY (PEIK) CERTIFICATE

The certification program at the PEIK are built on a series of foundational courses at the undergraduate level, supplemented with a broad array of more advanced elective courses related to power and energy.

These advanced courses will cover both conventional and emerging areas, including smart grid systems, distributed generation, system protection, energy storage, solar power systems, biofuels,

and others.

The undergraduate certificate program will mesh with the requirements for the various engineering majors, taking advantage of the fact that each major already has elective courses within their existing curriculum relevant to power and energy.

The structure of the certificate program will allow certification through electives requirements, with few if any additional courses beyond those required for the degree.

STUDENT LEAN CERTIFICATION COURSE

The College of Engineering Lean Systems Program offers a unique, week-long non-academic certification course for UK undergraduate students. It accommodates student academic schedules by being offered during semester breaks, typically in the summer. Students do not receive any credit towards their degree, but will receive a Lean Certification.

This fee-based course is designed to build students' basic knowledge of true lean principles and practices, plus the most important lean tools.

The program is an intensive five full days of hands-on instructional strategy, focused on the specially designed lean cylinder factory laboratory where regular, basic lean tools, standardization, collaborative problem solving, and continuous improvement are taught.

AUTOMOTIVE PRODUCTION ENGINEERING CERTIFICATE

The Automotive Production Engineering Certificate (APEC) introduces students to automotive manufacturing core processes. Using a project-based learning approach, the program has a capstone design at its heart. Students attend lectures and are assigned work on the major topics of design. The project itself is the result of a proposal from industry, and engineering organization, or an extra-curricular student organization.

Through collaboration with major automotive OEMs, the course instructors will identify current engineering problems that best fit the scope of the APEC Program. Students are required to take two core courses plus two electives for a total of fifteen hours, as well as completing a senior project to earn the certificate.

UNDERGRADUATE PROGRAM EDUCATIONAL OBJECTIVES

Present Educational Objectives –
Effective Fall 2015:

- Our graduates will be employed in mechanical engineering or a variety of related fields as professionals, or attend graduate and professional schools in their career paths.
- Our graduates will continue their education and professional growth by supporting or participating in professional societies, licensure programs, short courses, or other professional development activities.

Student Outcomes

The mechanical engineering faculty has adopted the engineering criteria “a” through “k” student outcomes, namely:

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

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Don't Forget: Data:

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Second Semester									
CHE 105*		4							
MA 114*		4							

[illegible]

CHE 107	3				
ME 220	3				
ME 350	3				

EM 313	3						
MA 214	3						

[illegible]

Second Semester									
ME 310		3							
ME 321		3							

[illegible][illegible][illegible]

Department Policy Considerations

Engineering Standing Date:
Engineering Standing GPA:
Cumulative GPA at ES Date:
Cumulative Hours:
Graduation Date:
Graduation GPA:
Graduation Honors:

Key: * - Course Must Be Completed with a C or Better Grade; ~ - Course for Transfer Students Only; AP - AP Credit; CLEP - CLEP Exam; ES - Engineering Standing; GEIA - KY General Education Transfer Agreement; IP - Course in Progress; RO - Repeat Option; T - Transfer Credit; USP - University Scholars Program

Mechanical Engineering

College of Engineering

The mechanical engineer's training is the broadest among the several fields of engineering. The mechanical engineer uses the techniques of mathematics combined with a specialized knowledge of the thermal and energy sciences, solid and fluid mechanics, and the properties of materials. This information is supplemented by an understanding of manufacturing processes, the design and control of systems, and the economics of the technological community.

Admission to the program is selective. Students should refer to the UK *Bulletin* for general information concerning admission and graduation requirements.

Degree Requirements

The following curriculum meets the requirements for a Bachelor of Science in Mechanical Engineering, provided the student satisfies the graduation requirements of the College of Engineering.

Freshman Year

First Semester	Hours
EGR 101 Engineering Exploration I § Δ	1
EGR 102 Fundamentals of Engineering Computing	2
CIS/WRD 110 Composition and Communication I	3
MA 113 Calculus I	4
PHY 231 General University Physics	4
PHY 241 General University Physics Laboratory	1
Second Semester	
EGR 103 Engineering Exploration II § Δ	2
MA 114 Calculus II	4
CIS/WRD 111 Composition and Communication II	3
CHE 105 General College Chemistry I	4
UK Core* – Social Sciences	3

Sophomore Year

First Semester	Hours
MA 213 Calculus III	4
PHY 232 General University Physics	4
PHY 242 General University Physics Laboratory	1
EM 221 Statics	3
ME 205 Computer Aided Engineering Graphics	3
CHE 107 General College Chemistry II	
or	
UK Core* – Humanities	3
Second Semester	
ME 220 Engineering Thermodynamics I	3
ME 251 Introduction to Materials and Manufacturing Processes	3
MA 214 Calculus IV	3
EM 313 Dynamics	3
UK Core* – Humanities	
or	
CHE 107 General College Chemistry II	3
UK Core* – Statistical Inferential Reasoning. Recommended:	
STA 210 Making Sense of Uncertainty:	
An Introduction to Statistical Reasoning	
or	
STA 381 Engineering Statistics – A Conceptual Approach	3

Junior Year

First Semester	Hours
EM 302 Mechanics of Deformable Solids	3
EE 305 Electrical Circuits and Electronics	3
ME 330 Fluid Mechanics	3
ME 340 Introduction to Mechanical Systems	3
WRD 204 Technical Writing**	3
Second Semester	
ME 310 Engineering Experimentation I	3
ME 321 Engineering Thermodynamics II	3
ME 325 Elements of Heat Transfer	3
ME 344 Mechanical Design	3
Mathematics Elective***	3

Senior Year

First Semester	Hours
ME 411 ME Capstone Design I	3
ME 311 Engineering Experimentation II	3
ME 440 Design of Control Systems	3
ME 501 Mechanical Design with Finite Element Methods	3
Technical Elective†	3
Second Semester	
ME 412 ME Capstone Design II	3
Technical Elective†	3
Technical Elective†	3
UK Core* – Citizenship - US	3
UK Core* – Global Dynamics	3

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

Δ Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

*To be selected from UK Core courses in consultation with the academic advisor.

**Graduation Composition and Communication Requirement (GCCCR) course.

***Mathematics Elective—choose one course from approved list.

†Technical Electives—choose 9 hours from approved list.

Mathematics Elective	Hours
Choose one course from the following:	
MA 320 Introductory Probability	3
MA 321 Introduction to Numerical Methods	3
MA 322 Matrix Algebra and Its Applications	3
MA 416G Introduction to Optimization	3
MA 432G Methods of Applied Mathematics I	3
MA 433G Introduction to Complex Variables	3
MA 481G Differential Equations	3
STA 381 Engineering Statistics – A Conceptual Approach	3
Subtotal: Mathematics Elective	3

–CONTINUED–

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at www.sacscoc.org for questions about the accreditation of University of Kentucky.

List of Approved ME Technical Electives

(Offered by ME Department or Cross-listed)

A minimum of six credit hours (two courses) must have an ME prefix or be cross-listed as an ME course.

ME 380 Topics in ME
ME 395 Independent Work in ME
ME 416 Automotive Painting Technology
ME 418 Automotive Assembly and Quality Control
ME/MFS 503 Lean Manufacturing
ME/MFS 505 Modeling of Manufacturing
ME/MSE 506 Mechanics of Comp. Materials
ME/MFS 507 Design for Manufacturing
ME 510 Vibro-Acoustic Design
ME/MFS 511 Machining of Materials and Applications
ME/MFS 512 Manufacturing Systems
ME/MFS 513 Mechanical Vibrations
ME 514 Comp Tech in Systems
ME/MFS 515 Rotordynamics of Turbomachinery
ME 516 Systems Engineering
ME/MFS/EE 526 Lean Operations Management
ME/MA 527 Applied Math in Nat Sci I
ME 530 Gas Dynamics
ME 531 Fluid Dynamics I
ME 532 Adv. Strength of Materials
ME 548 Aerodynamics of Turbomachinery
ME 549 Power Generation
ME/MFS/CME/MSE 554 Chemical and Physical Processing of Polymer Systems
ME/EE/MSE 555 Intro to Micro/Nano Elect Sys
ME/MFS/CME/MSE 556 Intro. to Composite Materials
ME 560 Engineering Optics (same as EE 566)
ME 563 Basic Combustion Phenom
ME 565 Scale Modeling in Engr.
ME/EE/MSE 570 Fundamentals of Nanoelectronic Devices and Materials
ME/BAE 580 Heating, Ventilating & Air Conditioning
ME/EE/BAE/EGR/MFS 583 Industrial Energy Utilization and Assessment
ME 599 Topics in ME

List of Approved Non-ME Technical Electives

(From other College Departments)

A maximum of three credit hours (one course) may be chosen from the courses listed below:

BAE 502 Modeling of Bio Systems

BME 405 Introduction to Biomedical Signal Processing
BME 472 Human Biomechanics
BME 485 Fundamentals of Biofluid Mechanics

BME 488 Introduction to Biomaterials
BME 508 Cell Mechanics and Mechanobiology
BME 515 Modeling of Physiological Systems
BME 530 Biomedical Instrumentation
BME 540 Mechanical Modeling of Human Motion
BME 579 Neural Engineering: Merging Engineering with Neuroscience
BME 580 Introduction to Biomedical Imaging

EGR 540 Power Economics and Public Policy
EGR 542 Electric Power Generation Technologies
EGR 546 Electric Power System Fundamentals
EGR 553 Environmental Consequences of Energy Production

MFS 509 Leadership for a Lean Enterprise
MFS/MNG 520 Industrial Automation and Control
MFS 525 Organizational Learning for Lean Manufacturing
MFS 599 Topics in Manufacturing Systems Engineering

MSE 201 Material Science

NOTE: For any courses not on the either of the approved lists, a student will submit a petition -- including justification -- to the DUS for an exception, which will be reviewed on a case-by-case basis.