HOW DO I GET OUT OF HERE?

The 2002 – 2003
George W. Woodruff
School of Mechanical Engineering
Undergraduate Guide

Georgia Institute of Technology

http://www.me.gatech.edu

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CONTENTS

INTRODUCTION

The Woodruff School of Mechanical Engineering

This guide details the bachelor's degree programs in the George W. Woodruff School of Mechanical Engineering at Georgia Tech. The history of Georgia Tech is synonymous with mechanical engineering, which is the oldest degree program on campus. In October 1888, 129 young men registered for the only degree-granting program when the Georgia School of Technology, as the Institute was then called, opened its doors as a School of Mechanical Engineering.

Today, the Woodruff School is the second largest unit in the nine engineering schools in the College of Engineering. In September 1985 the School assumed the name of one of its most distinguished alumni, Atlanta businessman and philanthropist, George W. Woodruff (class of 1917). The Woodruff School now offers undergraduate programs in mechanical engineering and nuclear and radiological engineering. We are one of the largest producers of bachelor's degrees in mechanical engineering in the country, and the undergraduate program is ranked 4th in the nation by *U. S. News & World Report*.

Because of the tremendous impact that mechanical engineering at Georgia Tech has had on the economy of Georgia and the Southeast, in 2000 the American Society of Mechanical Engineers designated the Woodruff School a National Mechanical Engineering Heritage Site. We are the only educational institution to receive this honor. Since 1971, only 220 sites, landmarks, and collections around the world have been designated by the ASME.

The undergraduate degree programs in the Woodruff School and the College of Engineering at Georgia Tech are accredited by the Accreditation Board for Engineering and Technology (ABET). The accreditation reports for our programs may be found at

http://www.me.gatech.edu/me/academics/abet/index.html
and
http://www.nre.gatech.edu/me/academics/abet/index.html

How Do I Get Out of Here?

This guide outlines the procedures that will help you earn a bachelor's degree from Georgia Tech. The general rules and regulations that govern all undergraduate students at Georgia Tech are found in the *Georgia Tech General Catalog*, particularly the section titled **Information for Undergraduate Students**. You **should carefully read the *Georgia Tech General Catalog* and this *Woodruff School Undergraduate Guide*,** which may also be found in its entirety on our home page at

http://www.me.gatech.edu/me/academics/book/

For the listing of all classes to be offered the following semester and complete registration information, go to the On-Line Student Computer Assisted Registration (OSCAR). OSCAR may be found on both the Georgia Tech and the Woodruff School web sites.

http://www.oscarweb.gatech.edu

This guide will be updated yearly, typically before the start of fall semester. However, any substantive changes made prior to that time will be posted to our web page with dispatch and an alert will be sent to you by electronic mail and posted to the news groups. Send suggestions and corrections to david.sanborn@me.gatech.edu.

If you have a question that neither the *General Catalog* nor this guide resolves, please contact the Woodruff School's Office of Student Services (the Academic Office).

Educational Objectives

The faculty and the Woodruff School Student Advisory Committee developed a set of educational objectives that we strive to follow. We want to:

- Prepare you for successful careers and life-long learning;
- Train you thoroughly in methods of analysis, including the mathematical and computational skills appropriate for engineers to use when solving problems;
- Develop the skills pertinent to the design process, including the ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively;
- Teach you to use current experimental and data analysis techniques for engineering application;
- Instill an understanding of your professional and ethical responsibilities.

When you graduate from the Woodruff School you will have gained abilities into each of these skills.

Students and Faculty Expectations

The students and faculty in the Woodruff School are committed to improving the quality of undergraduate education, including better communications between students and faculty. In this spirit, the Undergraduate Committee, the Woodruff School Student Advisory Committee, and the faculty prepared the following list of expectations.

Faculty Expectations of Students

- Review prerequisite course materials,
- Read handout materials provided in class,
- Complete out-of-class assignments on time,
- Come prepared for class,
- Participate in the classroom by asking questions and contributing to any discussion,
- Get help/feedback from the professor as needed, and
- Follow the Woodruff School Honor Code.

Student Expectations of Faculty

- Provide students with written documentation concerning course content and evaluation procedures,
- Set and advertise office hours and be available to students at other times by appointment,
- Put course material in context by relating it to real-world problems and applications, current research, or the content of other courses in the curriculum,
- Respect students and be receptive to their opinions and questions,

- Treat students fairly and equitably,
- Come prepared for class,
- Return graded material in a timely fashion, and
- Set examinations appropriately for the material being tested.

Woodruff School Honor Code
Preamble

Honesty is expected of all students and practitioners of Mechanical Engineering and Nuclear and Radiological Engineering. The Georgia Tech ***Academic Honor Code*** was developed by students and faculty to remind everyone of the importance of honesty in their professional lives. It also serves to increase awareness on the part of both students and faculty of the rules regarding academic honesty and the process to be followed when these rules are broken.

You are advised to review the code and bring any questions that you may have to the attention of your instructors. **The complete Georgia Tech *Academic Honor Code* can be found on the web at**

http://www.honor.gatech.edu

The following items are taken from this web site:

> "Students must sign the Honor Agreement affirming their commitment to uphold the Honor Code before becoming a part of the Georgia Tech community. The Honor Agreement may reappear on exams and other assignments to remind students of their responsibilities under the Georgia Institute of Technology ***Academic Honor Code***."
>
> Honor Agreement: "Having read the Georgia Institute of Technology ***Academic Honor Code***, I understand and accept my responsibility as a member of the Georgia Tech Community to uphold the Honor Code at all times. In addition, my options for reporting honor violations as detailed in the code."

Honor Pledge

All students are required, when requested, to attach the following statement to any material turned in for a grade in any course in the Woodruff School:

> **On my honor, I/we pledge that I/we have neither given nor received inappropriate aid in the preparation of this assignment.**
>
> _____
> **Signature(s)**

An assignment is incomplete without this pledge. It is the responsibility of the faculty member teaching the course to make clear to the students at the beginning of the semester what is considered appropriate and what is not.

Student Conduct

In addition to the honor pledge, you should be aware of the rules for student conduct found in the *Georgia Tech General Catalog.* Of particular relevance are those rules which apply to academic misconduct. Please refer to

http://www.deanofstudents.gatech.edu/integrity/academics/index.htm
or
http://www.registrar.gatech.edu/StuRules_Regulations.html

for the complete information on the code of student conduct.

Sources of Information

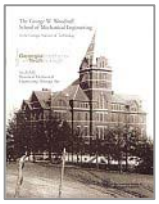
In addition to the *General Catalog* and the OSCAR, here are a number of sources of information about Georgia Tech and the Woodruff School that should be of help. Copies of these documents are available in the Academic Office or view the Woodruff School home page as another source of these materials.

Brochures

The Bachelor's Degree Program in Mechanical Engineering

Facts About the George W. Woodruff School of Mechanical Engineering

The George W. Woodruff School of Mechanical Engineering:
An ASME Mechanical Engineering Heritage Site



The Undergraduate Nuclear and Radiological Engineering Program at Georgia Tech

B.S. Degree in Nuclear and Radiological Engineering and
the Academic Common Market (BSNRE/ACM)

Research in the George W. Woodruff School of Mechanical Engineering

Web Sites

The Woodruff School's Home Page: http://www.me.gatech.edu
The Woodruff School has a dynamic home page where you can locate all sorts of information about our academic programs, course offerings, research programs, faculty and staff, student organizations, events, and other items. The **Undergraduate Programs** page should be a first stop as you navigate through the Woodruff School on the Internet. A search engine is also available at the site.

Georgia Tech's Home Page: **http://www.gatech.edu**

Note that both of these sites will soon have a new look, but the addresses will stay the same. Check the web for the new sites.

News Groups

To improve communications, the Woodruff School has four news groups:

- git.me.scholarships
- git.me.summer-opportunities (summer jobs and internships)
- git.me.job-opportunities
- git.me.general (important announcements, such as changes in the OSCAR)

You will learn how to read news groups in CS1321.

E-mail

Announcements are sometimes sent electronically, so it is important that you check your e-mail periodically. The Woodruff School uses this means of communication sparingly and only when the information requires a timely response.

Bulletin Boards

There are several bulletin boards in Woodruff School buildings. The one located outside the Office of Student Services (in the MRDC Building) is particularly important. Notices concerning class schedules, class cancellations, room assignments, initial class meeting times, program changes and modifications of academic rules and regulations, may be found here first. **It is your responsibility to check this bulletin board frequently**.

OFFICE OF STUDENT SERVICES (THE ACADEMIC OFFICE)

What is the Academic Office?

The purpose of the Office of Student Services, until recently known as the Academic Office, is to help you graduate with a bachelor's degree in mechanical engineering and/or nuclear and radiological engineering in a timely manner. To make this process as easy as possible, the Office of Student Services provides information about such things as:

- Advising
- Faculty
- Scholarships
- Summer Internships
- Tutoring Programs

Most importantly, please come to the Academic Office for any questions about the Woodruff School. Our staff will answer inquiries promptly and courteously and provide updated and accurate information about the Woodruff School, the College of Engineering, and the Institute. Any comments you have about the Academic Office may be sent to Dr. David Sanborn, Associate Chair for Undergraduate Studies at david.sanborn@me.gatech.edu.

Hours and Location

The Office of Student Services (the Academic Office) is located in the MRDC Building, Room 3112. It is open daily, Monday through Friday, from 8 a.m. to noon and 1 p.m. to 5 p.m.

Staff

Though the Woodruff School is large, you will receive a good deal of individualized attention, particularly with regard to advising. Some of our resources are described below:

Dr. David Sanborn, Associate Chair for Undergraduate Studies

- Oversight of the undergraduate program in the Woodruff School,
- Supervises the undergraduate section of the Academic Office,
- *Ex officio* member of the School's Undergraduate Committee,
- Liaison for the undergraduate program with other academic units on the Georgia Tech campus.

Professor Chris Lynch, Associate Chair for Administration

- Responsible for the scheduling of classes and registration.

Farzad Rahnema, Associate Chair of the Woodruff School and Chair of the Nuclear and Radiological Engineering and Health Physics Program

- Oversees undergraduate and graduate student recruiting, advising and retention for NRE/HP in coordination with the Woodruff School Academic Office

Kimberly Blue, Undergraduate Academic Advisor

- Advises all undergraduate, prospective, and newly admitted Woodruff School students,
- Talks with almost every student for the purpose of scheduling and planning a program of study, setting academic goals, and other concerns regarding the academic program in the Woodruff School,
- Participates in various outreach programs, open houses for families of our students, orientation sessions, and advises student groups,
- Determines if students have fulfilled the requirements for graduation.

Norma Frank, Academic Advisor I

- Supports the School's undergraduate programs in classroom assignments, exam schedules, reporting of grades, registration, and ordering textbooks,
- Interacts closely with the students and faculty.


David Sanborn


Chris Lynch


Farzad Rahnema


Kimberly Blue


Norma Frank

Academic Advising

The Woodruff School is committed to your academic, personal, and professional development. Academic advising is an important part of the process for planning your career at Georgia Tech.

How to See the Academic Advisor

To see the Academic Advisor, Ms. Blue, come to the Academic Office to schedule an appointment or to have a walk-in meeting. You may also call (404) 894-3203 or send an e-mail request to Ms. Frank at norma.frank@me.gatech.edu.

Because registering for the correct courses is an important ingredient for academic success, we strongly advise that you schedule a meeting early in the semester to develop a plan for several semesters, especially if you are a co-op student. Note that registration periods are the busiest time for advising.

Your Meeting with the Advisor

Before your appointment, you should prepare:

- A draft of your proposed class schedule, and
- A list of questions.

Make sure you have compared your proposed course schedule with the curriculum given in this guide or on the web at

http://www.me.gatech.edu/me/academics/book/

Be sure to check the prerequisites and corequisites for each course. Many of your questions can be answered by browsing through the appropriate sections of this book.

Appointment and Walk-In Advising

Appointments

Tuesday and Wednesday
9 a.m. to noon and 1 p.m. to 4 p.m.

Walk-in Advising

Monday, Thursday and Friday
9 a.m. to noon and 1 p.m. to 4 p.m.

Note that the times of Ms. Blue's availability might vary.

THE UNDERGRADUATE PROGRAMS

Degrees

The Woodruff School offers two undergraduate degrees: A bachelor's of science degree in mechanical engineering (BSME) and one in nuclear and radiological engineering (BSNRE). One hundred and twenty six credits are required for graduation with either degree. Also, with the proper planning you can complete the combined BS/MS program in five years.

What You Need to Know

The Woodruff School educates students who will become the leaders in industry and academia. We expect our graduates to serve the profession, the state of Georgia, and the country. To do this, our program will teach you:

- An ability to apply a knowledge of mathematics, through multivariate calculus and differential equations, science and engineering;
- An ability to design and conduct experiments, as well as to analyze and interpret data;
- An ability to design a system, component, or process to meet desired needs;
- An ability to function in multidisciplinary teams;
- An ability to identify, formulate, and solve engineering problems;
- An understanding of professional and ethical responsibility;
- An ability to communicate effectively;
- The broad education necessary to understand the impact of engineering solutions in a global and societal context;
- A recognition of the need for and an ability to engage in life-long learning;
- A knowledge of contemporary issues;
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
- A familiarity with statistics and linear algebra;
- An ability to work professionally in both thermal and mechanical systems areas, including the design and realization of such systems;
- A knowledge of chemistry and calculus-based physics with depth in at least one of them;
- A competence in the use of computational tools.

Requirements

Grade Point Average (GPA)

To receive a bachelor's degree from Georgia Tech, you must have a cumulative grade point average (GPA) of at least 2.0 at the time of graduation. Also, the GPA of the mechanical engineering courses on the BSME or BSNRE degree petition must be at least 2.0.

Mathematics

Mechanical engineering or nuclear and radiological engineering students must complete the required mathematics courses:

MATH 1501	Calculus I
MATH 1502	Calculus II
MATH 2401	Calculus III
MATH 2403	Differential Equations
MATH 4581	Classical Mathematical Methods in Engineering (NRE students only)

with a grade of C or better. If you make a D or an F in a required math course you are required to repeat the class the following semester at Georgia Tech. **The class may not be repeated at another school.**

U. S. Constitution and History Requirement

Georgia law requires that you demonstrate competence in United States and Georgia history and constitutional government before receiving an undergraduate degree. You can choose from:

HIST 2111	The United States to 1877
HIST 2112	The United States Since 1877
INTA 1200	American Government in Comparative Perspective
POL 1101	Government of the United States
PUBP 3000	American Constitutional Issues

Ethics

An ethics course is required. You can choose from

INTA 2030	Ethics and International Affairs (Social Science)
PST 3105	Theories of Ethics (Humanities)
PST 3109	Ethics for the Technical Professions (Humanities)
PST 3127	Science Technology and Human Values (Humanities)
PST 4176	Environmental Ethics (Humanities)

to fulfill this requirement.

Economics

An economics course is required. You can choose from:

ECON 2100	Economic Analysis and Policy Problems
ECON 2105	Principles of Macroeconomics
ECON 2106	Principles of Microeconomics

Humanities and Social Science

For complete information on the humanities and social science requirements, go to the Academic Office and pick up a Quick Guide.

Regents' Test

Each student in the University System of Georgia must demonstrate proficiency in reading and composition in English by passing the Regents' Test. You are eligible to take the test after you have earned ten hours of course credit. **(If you have earned 45 credit hours and have not passed the Regents' Test, schedule remedial English (ENGL 0012 and/or 0015) in addition to your regular course work.)** For nonnative speakers of English, alternative tests are available through the Department of Modern Languages.

If you need preparation for the Regents' Test, the English Department offers **ENGL 0012** and **ENGL 0015** and a workshop to improve reading and writing skills. Freshman English courses also include a unit on the Regents' Test.

Registration

For questions about registration, go to

http://www.registrar.gatech.edu

or the OSCAR web site at

http://oscarweb.gatech.edu

Restricted or Graduate Courses

To register for restricted or graduate courses, ask the appropriate department to enter the permit online. Once the permit is obtained, you may register.

Overloads of Closed Sections

To register for a section of a course that is closed, go to the school or department offering the course and request an **Overload Permit**. For ME or NRE courses, go to the Administrative Office (MRDC, Room 3200) and see Dr. Chris Lynch.

Holds

If your personal registration shows a **hold**, check the OSCAR for an interpretation of the particular hold and instructions for its clearance. For a hold in ME or NRE, see Ms. Frank.

Cross Registration

If you would like to take courses not offered at Georgia Tech, you can do so through the cross-registration program administered through the University Center in Georgia. Contact the Registrar's Office at (404) 894-4150 or view

http://www.registrar.gatech.edu

Bring the completed form to the Academic Office for a signature.

Course Meeting Places

Times and meeting places of classes are listed at

http://oscarweb.gatech.edu

THE CURRICULUM

The undergraduate curriculum in mechanical engineering covers the fundamental aspects of the field, emphasizes basic principles, and educates you in the use of these principles to solve engineering problems. Emphasis in the freshman and sophomore years is on mathematics, chemistry, physics, introductory mechanics, and engineering graphics, with an introduction to design. The junior and senior years are devoted to the mechanics of materials, applied mechanics, thermodynamics, heat transfer, fluid mechanics, systems and control, design, manufacturing, and the application of fundamentals to the diverse problems of mechanical engineering. The curriculum stresses laboratory work and design projects. You will often work in teams to complete projects. Enhanced computer skills, which are a prerequisite for all junior and senior-level courses, are obtained in courses throughout the curriculum. The design sequence and the lab sequence are required of all undergraduate students. The curriculum by hours and by semester with detailed footnotes for the B.S.M.E. and the B.S.N.R.E programs follow. You may also access this material at

http://www.me.gatech.edu/me/semester_conversion/index1.htm
or
http://www.me.gatech.edu/me/semester_conversion/index1_bnre.htm

Prerequisites and Corequisites

The prerequisites and corequisites for each course in ME and NRE are attached. Also, prerequisites for each course can be found in the course syllabi accessible from our home page by going to

http://www.me.gatech.edu/me/academics/

It is your responsibility to check the prerequisites before registering for any course. OSCAR allows you to display course catalog descriptions, including prerequisites, while you are registering. The computer checks prerequisites, only allowing you to register for courses you are prepared to take.

Technical Electives

Technical electives may be chosen from any course offered in the Colleges of Engineering, Science, or Computing at the 3000 or 4000 level that does not substantially overlap an undergraduate course that you intend to include in your degree petition. Thus, you cannot take electives that overlap either a course required by name and number for your degree or any courses that you intend to use on your degree petition to help meet the elective requirements for your degree. Consult with Ms. Blue if you have any questions about the suitability of any particular course as a technical elective.

When planning your schedule, it is important that you keep alternatives in mind because a course might be filled, there might be time conflicts, or the class might be canceled if the enrollment is less than 15 students. However, the Woodruff School tries to offer a course when there is sufficient demand, even if the class was not planned for that semester. To request a course, you should act well before the semester begins by circulating a petition and bringing it to the Academic Office. Also, be especially careful in planning your electives for your last semester, particularly if it is a summer semester. There are fewer electives offered in the summer.

Elective courses are generally taught once a year or once every two years. To learn which mechanical engineering and nuclear and radiological engineering electives will be offered in a particular semester, check with the Academic Office. Listed below are the technical elective course options for ME and NRE.

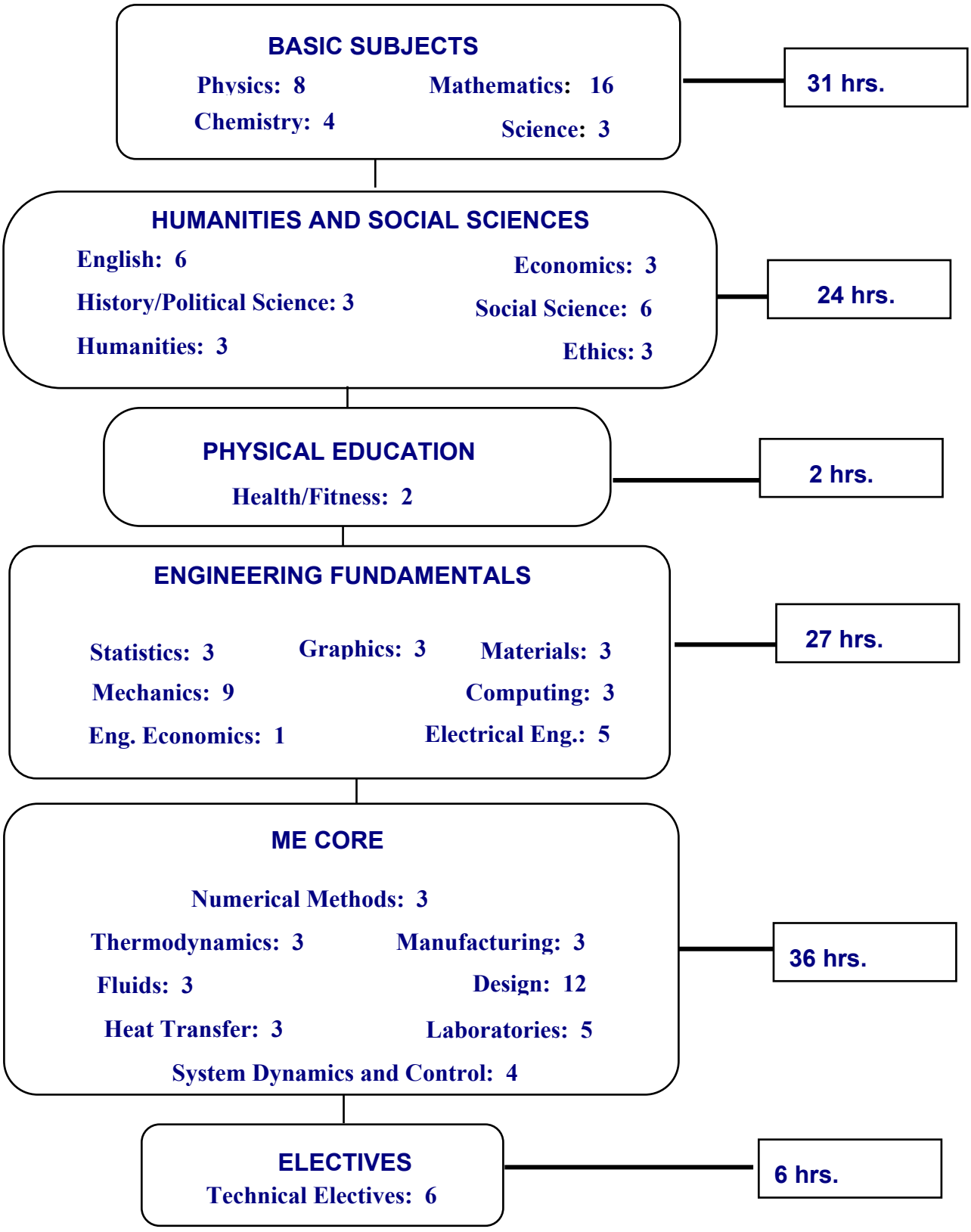
Mechanical Engineering Options

ME 4041	Interactive Computer Graphics and Computer-Aided Design
ME 4113	Kinematics and Dynamics of Linkages
ME 4171	Environmentally Conscious Design and Manufac
ME 4172	Designing Sustainable Engineering Systems
ME 4189	Structural Vibrations
ME 4193	Tribological Design
ME 4211	Manufacturing Engineering and Process Applicat
ME 4213	Materials Selection and Failure Analysis
ME 4321	Refrigeration and Air Conditioning
ME 4324	Power Generation Technology
ME 4330	Heat and Mass Exchangers
ME 4340	Applied Fluid Mechanics
ME 4342	Computational Fluid Dynamics
ME 4447	Microprocessor Control of Manufacturing Systen
ME 4450	Robotics
ME 4757	Biofluid Mechanics
ME 4758	Biosolid Mechanics
ME 4760	Engineering Acoustics and Noise Control
ME 4763	Pulping and Chemical Recovery
ME 4764	Bleaching and Papermaking
ME 4775	Polymer Science and Engineering I: Formation a Properties
ME 4776	Polymer Science and Engineering II: Analysis, Processing and Laboratory
ME 4777	Introduction to Polymer Science and Engineering
ME 4781	Biomedical Instrumentation
ME 4782	Biosystems Analysis
ME 4791	Mechanical Behavior of Composites
ME 4793	Composite Materials and Processes
ME 4794	Composite Materials and Manufacturing
ME 4801-2-3-4-5	Special Topics, Mechanical Engineering
ME 4811-2-3-4-5	Special Topics, Mechanical Engineering
ME 4821-2-3-4-5	Special Topics, Mechanical Engineering
ME 4831-2-3-4-5	Special Topics, Mechanical Engineering
ME 4901	Special Problems, Mechanical Engineering

Nuclear and Radiological Options

NRE 4234	Nuclear Criticality Safety Engineering
NRE 4266	Light Water Reactor Technology
NRE 4335	Radiation Imaging
NRE 4404	Radiological Assessment and Waste Management
NRE 4430	Nuclear Regulatory Requirements
NRE 4610	Introduction to Plasma Physics and Fusion Engineering
NRE 47XX	Nuclear Chemical Engineering
NRE 4801-2-3-4-5	Special Topics in Nuclear and Radiological Engineering
NRE 4901	Special Problems in Nuclear and Radiological Engineering

BSME CURRICULUM BY HOURS



TOTAL HOURS = 126

BSME CURRICULUM By SEMESTER

FRESHMAN YEAR	1st Semester	2nd Semester
Calculus I (MATH 1501)	4-0-4	
Calculus II (MATH 1502)		4-0-4
English Composition I (ENG 1101)	3-0-3	
English Composition II (ENG 1102)		3-0-3
General Chemistry I (CHEM 1310)	3-3-4	
General Physics I (mechanics) (PHYS 2211)		3-3-4
Hist/Poly Sci Requirement[1]	3-0-3	
Introduction to Computing (CS 1321)		3-0-3
Intro to Eng. Graphs. & Vis. (ME/CE 1770)		2-3-3
Wellness[2]	X-X-2	
TOTALS	**X-X-16**	**15-6-17**

SOPHOMORE YEAR	1st Semester	2nd Semester
Calculus III (MATH 2401)	4-0-4	
Differential Equations (MATH 2403)		4-0-4
General Physics II (mag/optics) (PHYS 2212)	3-3-4	
Circuits and Electronics (ECE 3710)		2-0-2
Intro to Mechanics (statics/def bods) (ME 2211)	3-0-3	
Dynamics of rigid Bodies (ME 2202)		3-0-3
Creative Decisions and Design (ME 2110)	2-3-3	
Principles & Applications of Eng. Materials (MSE 2001)		3-0-3
Computing Techniques (ME 2016)	3-0-3	
Science [3]		3-0-3
TOTALS	**15-6-17**	**15-0-15**

JUNIOR YEAR	1st Semester	2nd Semester
System Dynamics & Control (ME 3015)	4-0-4	
Experimental Methodology Lab (ME 3056)		1-2-2
Thermodynamics (ME 3322)	3-0-3	
Economics Social Science[4]	3-0-3	
Fluid Mechanics (ME 3340)	3-0-3	
Heat Transfer (ME 3345)		3-0-3
Essentials of Eng.Economy (ISyE 3025)		1-0-1
Machine Design (ME 3180)		3-0-3
Mechanics of Materials (ME 3201)	3-0-3	
Statistics & Applications (MATH/ISyE 3770)		3-0-3
Instrumentation & Electronics Lab (ECE 3741)	0-3-1	
Energy Conversion & Mechatronics (ECE 3301)		1-2-2
TOTALS	**16-3-17**	**12-4-14**

SENIOR YEAR	1st Semester	2nd Semester
Mechanical Eng Systems Lab (ME 4053)	1-2-2	
Experimental Eng. Lab (ME 4055)		0-3-1
Energy systems Analysis & Design (ME 4315)	3-0-3	
Capstone Design (ME 4182)		1-6-3
Engineering Ethics [5] (Social Science or Humanities)		3-0-3
Manufacturing Processes & Eng. (ME 4210)	3-0-3	
Technical Elective [6]		X-X-3
Social Science Elective	3-0-3	3-0-3
Humanities Elective	3-0-3	
Technical Elective		X-X-3
TOTALS	**13-2-14**	**X-X-16**

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[1] Choose from

HIST 2111	The United States to 1877	3-0-3
HIST 2112	The United States Since 1877	3-0-3
POL 1101	Government of the United States	3-0-3
PUBP 3000	American Constitutional Issues	3-0-3
INTA 1200	American Government in Comparative Perspective	3-0-3

[2]Choose from

HPS 1040	Health Concepts & Strategies	2-0-2
HPS 1062	Fitness Concepts: Running	1-2-2
HPS 1063	Fitness Concepts: Swimming	1-2-2
HPS 1064	Fitness Concepts: Cross Training	1-2-2

[3]Choose from

CHEM 1311	Inorganic Chemistry	3-0-3
AND		
CHEM 1312	Inorganic Chemistry Lab	0-3-1
(Must be taken concurrently)		
OR ONE OF THE FOLLOWING:		
BIOL 1510	Biological Principles	3-3-4
BIOL 1520	Intro to Organismal Biology	3-3-4
EAS 1600	Intro to Environmental Science	2-6-4
EAS 1601	Habitable Planet	3-3-4
PHYS 2213	Modern Physics	3-0-3

[4]Choose from

ECON 2100	Economic Analysis & Policy Problems	3-0-3
ECON 2105	Principles of Macroeconomics	3-0-3
ECON 2106	Principles of Microeconomics	3-0-3

[5]To fulfill the ethics requirement, choose one of these courses:

PST 3105	Theories of Ethics (Humanities)	3-0-3
PST 3109	Ethics for the Technical Professions (Humanities)	3-0-3
PST 3127	Science Technology and Human Values (Humanities)	3-0-3
PST 4176	Environmental Ethics (Humanities)	3-0-3
INTA 2030	Ethics in International Affairs (Social Science)	3-0-3

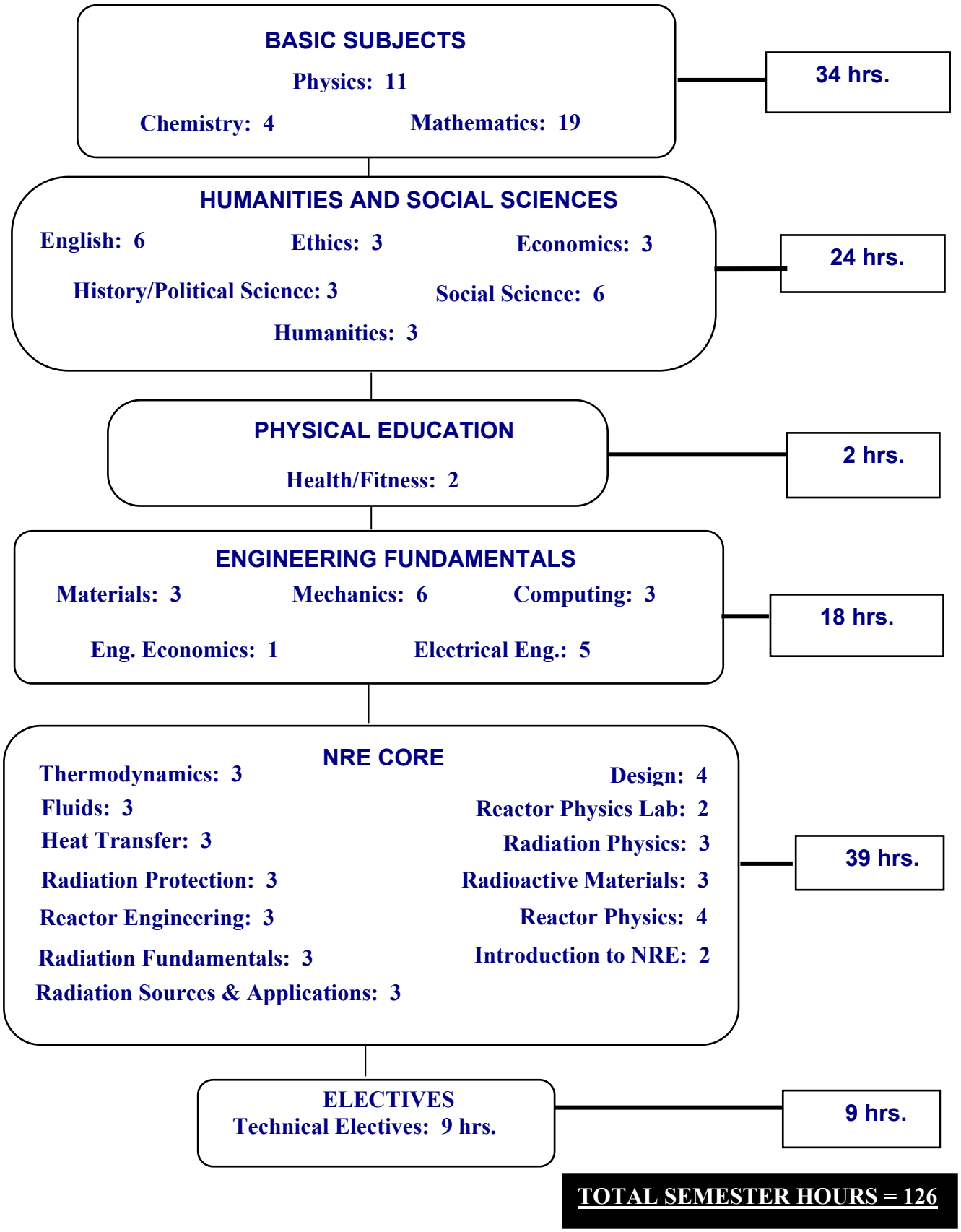
[6]Technical Electives may be selected from any course offered in the Colleges of Engineering, Science, or Computing at the 3000 or 4000 level that does not substantially overlap an undergraduate course which you intend to include in your degree petition. Thus, you cannot take electives which overlap either a course required by name and number for your degree or any courses which you intend to use on your degree petition to help meet the elective requirements for your degree. You should consult with your Undergraduate Advisor if you have any questions about the suitability of any particular course as a technical elective.

Pre/Corequisites for ME Courses

You must complete satisfactorily the appropriate prerequisites or their equivalents before enrolling in any ME course. Corequisites may be taken simultaneously.

Course	Prerequisites	Corequisites
ME 1750	Introduction to Bioengineering	
ME 1770	Math 1501	Math 1501
ME 2016	Math 1502, CS 1321	Math 2401
ME 2110	ME/AE/CE 1770	ME 2211, ME 2016
ME 2202	ME 2211, ME 2016	
ME 2211	PHYS 2211	Math 2401
ME 3015	ME 2016, ECE 3710, Math 2403, ME 2202	ECE 3741
ME 3056	ME 2016, ME 3322, Math 2403, ME 3201, ME 3340, ME 3015	ISYE/Math 3770, ME 3345
ME 3180	ME 3201, ME/AE/CE 1770	
ME 3201	ME 2016, ME 2211	Math 2403, MSE 2001
ME 3322	Phys 2211, Math 2403, ME 2016	
ME 3340	Math 2403, ME 2211, ME 2202	ME 3322
ME 3345	ME 2016, ME 3322, Math 2403, ME 3340	
ME 3720	Phys 2211, Math 2403, CHEM 1310	
ME 4041	ME 1770, ME 3180, ME 3201, ME 3345	ME/AE/CEE 1770
ME 4053	ME 3056, ME3345, Math/ISYE 3770	
ME 4055	ME 4053	
ME 4113	ME 2202	
ME 4171	Senior Standing	
ME 4172	Senior Standing	
ME 4182	ME 3180, ME 4315, ME 4210	
ME 4189	ME 3015	
ME 4193	ME 3201, ME 3340	
ME 4205	ME 2110, ESM 3311	
ME 4210	ME 3340, ME 3345, ISYE/Math 3770	
ME 4211	ME 3201, ISYE/Math 3770	
ME 4213	ME 3201	
ME 4315	ME/AE/CE 1770, ISYE 3025, ME 3322, ME 3345	ME 4210
ME 4321	ME 3322, ME 3345	
ME 4324	ISYE 3025, ME 3345	
ME 4330	ME 3345	
ME 4340	ME 3345	
ME 4342	ME 3345	
ME 4447	ME 3015, ME 3056	
ME 4450	ME 3015	
ME 4757	ME 3340, AE 2020	ME 3015
ME 4758	Math 2403, ME 3311, ME 3201	
ME 4760	Math 2403	
ME 4775	CHEM 2312, CHEM 3411	
ME 4776	CHE, CHEM, ME, MSE, TFE 4775	
ME 4777	Math 2403	
ME 4781	ECE 3050	
ME 4782	Math 1502	
ME 4791	ME 3201	
ME 4793	Chem 1310, Phys 2211, Phys 2212	
ME 4794	Chem 1310, Phys 2212	

BSNRE CURRICULUM BY HOURS



BSNRE CURRICULUM BY SEMESTER

FRESHMAN YEAR	1st Semester	2nd Semester
Calculus I (MATH 1501)	4-0-4	
Calculus II (MATH 1502)		4-0-4
English Composition I (ENG 1101)	3-0-3	
English Composition II (ENG 1102)		3-0-3
General Chemistry I (CHEM 1310)	3-3-4	
General Physics I (mechanics) (PHYS 2211)		3-3-4
Hist/Poly Sci Requirement[1]	3-0-3	
Introduction to Computing (CS 1321)		2-3-3
Intro to NRE 2110		2-0-2
Wellness[2]	X-X-2	
TOTALS	**X-X-16**	**14-6-16**

SOPHOMORE YEAR	1st Semester	2nd Semester
Calculus III (MATH 2401)	4-0-4	
Differential Equations (MATH 2403)		4-0-4
General Physics II (mag/optics) (PHYS 2212)	3-3-4	
Circuits and Electronics (ECE 3710)		2-0-2
Intro to Mechanics (statics/def bods) (ME 2211)	3-0-3	
Intro to Modern Physics (PHYS 2213)		3-0-3
Humanities Elective	3-0-3	
Princ. & Appl Eng. Materials (MSE 2001)		3-0-3
Economics Social Science[3]	3-0-3	
NRE Fundamentals (NRE 3212)		3-0-3
TOTALS	**16-3-17**	**15-0-15**

JUNIOR YEAR	1st Semester	2nd Semester
Thermodynamics (ME 3322)	3-0-3	
Mechanics of Materials (ME 3201)		3-0-3
Fluid Mechanics (ME 3340)	3-0-3	
Radiation Protection Eng. (NRE 3316)		3-0-3
Radiation Physics (NRE 3301)	3-0-3	
Nuclear Radiation Detection (NRE 3112)		2-3-3
Instrumentation & Electronics Lab (ECE 3741)	0-3-1	
Social Science Elective	3-0-3	
Essentials of Eng. Economy (ISyE 3025)	1-0-1	
Energy Conversion & Mechatronics (ECE 3301)		1-2-2
Heat Transfer (ME 3345)		3-0-3
Classical Mathematical Methods in Eng. (MATH 4581)		3-0-3
TOTALS	**13-3-14**	**15-5-17**

SENIOR YEAR	1st Semester	2nd Semester
Reactor Engineering (NRE 4214)	3-0-3	
Technical Elective[4]	3-0-3	6-0-6
Radiation Sources & Applications (NRE 4328)	3-0-3	
NRE Design (NRE 4232)		1-9-4
Radiation Physics Lab (NRE 4206)		1-3-2
Nuclear Reactor Physics (NRE 4204)	4-0-4	
Ethics [5]	3-0-3	
Social Science Elective		3-0-3
TOTALS	**16-0-16**	**11-12-15**

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[1] Choose from

HIST 2111	The United States to 1877	3-0-3
HIST 2112	The United States Since 1877	3-0-3
POL 1101	Government of the United States	3-0-3
PUBP 3000	American Constitutional Issues	3-0-3
INTA 1200	American Government in Comparative Perspective	3-0-3

[2]Choose from

HPS 1040	Health Concepts & Strategies	2-0-2
HPS 1062	Fitness Concepts: Running	1-2-2
HPS 1063	Fitness Concepts: Swimming	1-2-2
HPS 1064	Fitness Concepts: Cross Training	1-2-2

[3]Choose from

ECON 2100	Economic Analysis & Policy Problems	3-0-3
ECON 2105	Principles of Macroeconomics	3-0-3
ECON 2106	Principles of Microeconomics	3-0-3

[4]Technical Electives may be selected from any course offered in the Colleges of Engineering, Science, or Computing at the 3000 or 4000 level that does not substantially overlap an undergraduate course which you intend to include in your degree petition. Thus, you cannot take electives which overlap either a course required by name and number for your degree or any courses which you intend to use on your degree petition to help meet the elective requirements for your degree. You should consult with your Undergraduate Advisor if you have any questions about the suitability of any particular course as a technical elective.

[5]To fulfill the ethics requirement, choose one of these courses:

PST 3105	Theories of Ethics (Humanities)	3-0-3
PST 3109	Ethics for the Technical Professions (Humanities)	3-0-3
PST 3127	Science Technology and Human Values (Humanities)	3-0-3
PST 4176	Environmental Ethics (Humanities)	3-0-3
INTA 2030	Ethics in International Affairs (Social Science)	3-0-3

Pre/Corequisites for NRE Courses

You must complete satisfactorily the appropriate prerequisites or their equivalents before enrolling in any NRE course. Corequisites may be taken simultaneously.

NRE Course	Prerequisites	Corequisites
NRE 2110	None	
NRE 3111	NRE 3301	
NRE 3301	Phys 2213	
NRE 3316	NRE 3301, Math 2403	Phys 3001
NRE 4204	NRE 3301	Math 4581
NRE 4206	NRE 4204, NRE 3111	
NRE 4214	ME 3323, ME 3340, ME 3345	
NRE 4232	NRE 4316	
NRE 4234	NRE 4204	
NRE 4266	NRE 4204, NRE 4214	
NRE 4316	NRE 4204	
NRE 4326	NRE 4316	
NRE 4335	NRE 3311, NRE 4204	
NRE 4404	NRE 3316	
NRE 4430	NRE 3316	
NRE 4610	Senior standing in science or engineering	
NRE 4801-2-3	Consent of the School	
NRE 4901-2-3	Consent of the School	

COURSES

All courses in Mechanical Engineering and Nuclear and Radiological Engineering are described in the *Georgia Tech General Catalog*. In addition, go to

http://www.me.gatech.edu/me/academics/

to view the courses and syllabi.

Required Courses in Mechanical Engineering

The Mechanical Engineering Program tries to offer its required courses, as given below, every semester, including summer.

ME/CEE/AE 1770 Introduction to Engineering Graphics and Visualization
Introduction to engineering graphics and visualization including sketching, line drawing, and solid modeling. Development and interpretation of drawings and specifications for product realization

ME 2016 Computing Techniques
An introduction to the use of computers and MATLAB programming for the solution of mechanical engineering problems. Topics include: sources of errors in computing, the use of modular software design, basic numerical methods, and signal processing.

ME 2110 Creative Decisions and Design
To learn fundamental techniques for creating, analyzing, synthesizing, and implementing design solutions to open ended problems with flexibility, adaptability, and creativity through team and individual efforts.

ME 2202 Dynamics of Rigid Bodies
Kinematics and dynamics of particles and rigid bodies in one, two, and three dimensions. Work-energy and impulse-momentum concepts

ME 2211 Introduction to Mechanics
Forces and moments; equilibrium in two and three dimensions; multiforce members; friction; stress and strain; axially loading, torsion, and bending of beams.

ME 3015 System Dynamics and Control
Dynamic modeling and response of systems with mechanical, hydraulic, thermal and/or electrical elements. Linear feedback control systems design and analysis in time and frequency domains.

ME 3056 Experimental Methodology Laboratory
Introduction to basic instrumentation used in mechanical engineering, including calibration, use, precision, and accuracy. Consideration of errors, precision, and accuracy in experimental measurements.

ME 3180 Machine Design
The selection, analysis, and synthesis of springs, joining and fastening methods, bearings, shafts, gears, and other elements. Design of assemblies. Computer based methods.

ME 3201 Mechanics of Materials
Analysis of stress and strain applied to beams, pressure vessels, and combined loading; problems involving resistance of materials to plastic deformation, fracture, fatigue, and creep.

ME 3322 Thermodynamics

Introduction to thermodynamics. Thermodynamic properties, energy and mass conservation, entropy and the second law. Second-law analysis of thermodynamic systems, gas cycles, vapor cycles.

ME 3340 Fluid Mechanics

The fundamentals of fluid mechanics. Topics include fluid statics, control-volume analysis, the Navier-Stokes equations, similitude, viscous, inviscid and turbulent flows, boundary layers.

ME 3345 Heat Transfer

Introduction to the study of heat transfer, transport coefficients, steady state conduction, transient conduction, radiative heat transfer, and forced and natural convection.

ME 4053 Mechanical Engineering Systems Laboratory

Measurement, and analysis of mechanical, acoustic, manufacturing, thermodynamic, fluid, and heat transfer phenomena. Emphasis on data acquisition, reduction, analysis, and report preparation.

ME 4055 Experimental Engineering

Application of experimental techniques to engineering problems involving various mechanical engineering processes and systems. Open-ended investigations are accomplished by teams.

ME 4182 Capstone Design Project

Teams apply a systematic design process to real multidisciplinary problems. Problems selected from a broad spectrum of interest areas, including biomedical, ecological, environmental, mechanical, and thermal.

ME 4210 Manufacturing Processes and Engineering

Major manufacturing processes, their capabilities, analysis, and economics. Manufacturing process selection

ME 4182 Capstone Design Project

Teams apply a systematic design process to real multidisciplinary problems. Problems selected from a broad spectrum of interest areas, including biomedical, ecological, environmental, mechanical, and thermal.

ME 4210 Manufacturing Processes and Engineering

Major manufacturing processes, their capabilities, analysis, and economics. Manufacturing process selection

ME 4315 Energy Systems Analysis and Design

Integrated concepts, laws, and methodologies from thermal sciences are used to analyze, model, and design energy systems and to predict system performance for fixed designs.

Required Courses in Nuclear and Radiological Engineering

The Nuclear and Radiological Engineering Program offers each course **once per academic year** as outlined in the suggested Program of Study. No undergraduate NRE courses are offered in the summer.

NRE 2110 Introduction to Nuclear and Radiological Engineering

Introduction to nuclear and radiological engineering; nuclear energy production and radiation technologies; their role and importance to society; their environmental impact.

NRE 3112 Nuclear Radiation Detection

An introduction to the principles and characteristics of basic detectors for nuclear radiation and the pulse processing electronics associated with them

NRE 3212 Fundamentals of Nuclear and Radiological Engineering

Intermediate treatment of nuclear and radiological engineering, with emphasis on reactor physics and engineering, radiation protection and radiation shielding.

NRE 3301 Radiation Physics

Characteristics of atomic and nuclear radiations, transition probabilities, radioactivity, classical and quantum-mechanical derivations of cross sections, interaction of photon, neutron, and charged particles with matter.

NRE 3316 Radiation Protection Engineering

Covers radiation dosimetry, biological effects of radiation, radiation-protection criteria and exposure limits, external radiation protection, internal radiation protection, and sources of human exposure.

NRE 4204 Nuclear Reactor Physics

This course covers physical principles of nuclear reactors. Topics include neutron diffusion theory, criticality and multigroup theory, slowing down theory, heterogeneity effects and reactor kinetics.

NRE 4206 Radiation Physics Laboratory

Measurements of reactor parameters such as approach to criticality, flux mapping, buckling, and diffusion length using subcritical assemblies. Neutron spectral measurements, shield transmission measurements and other radiation field measurements.

NRE 4214 Reactor Engineering

Nuclear heat generation; fuel elements' thermal analysis; single and two phase flow and heat transfer in reactor systems; core thermal design and treatment of uncertainties

NRE 4232 Nuclear Radiological Engineering Design

Introduction to the methodologies of nuclear and radiological design. An open-ended design project that integrates all relevant engineering aspects is to be completed in this course.

NRE 4328 Radiation Sources and Applications

Radiation Sources, Radioisotope Production, Application of Radiation and Radioisotope technology in industry and medicine.

Special Problems Courses

If you have completed the sophomore year with a grade point average of 2.5 or better, you may use a maximum of four credit hours of Special Problems, ME/NRE 4901, for technical elective credit. A special project is individual study in a specialized area under the direction of a member of the Woodruff School faculty. The project may be either a mathematical analysis or an experimental investigation of a problem or a design project of interest to you and the faculty advisor.

To register for ME/NRE 4901, you must select a project and find a faculty member to direct it. Many faculty have already developed projects, and a notebook in the Academic Office contains a description of each, the requirements for successful completion of the project, and the credit available. You are also encouraged to propose a project and to ask a faculty member to help direct it. Ms. Blue can help you make contact with faculty who have projects.

Procedures

Once a project is defined and a professor has agreed to serve as the advisor, it is your responsibility to prepare a **Special Problem Statement** if one does not already exist and to obtain the signature of the faculty advisor and Dr. David Sanborn. Then sign the form, accepting responsibility for completing the project for the agreed number of credit hours. This completed form, including all the required signatures, **must** be placed in the Special Problem Book in the Academic Office **before** you may register for the course. The form and School

policies on Special Problems are available in the Academic Office or the professor with whom you propose to work with can download it from

http://www.me.gatech.edu/internal/

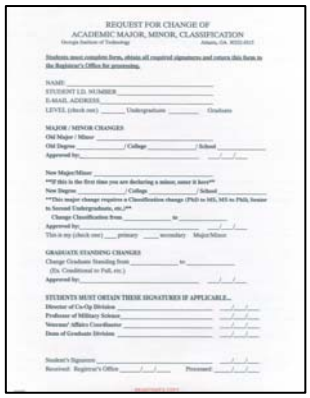
Each special problem must culminate in a written final report which is to be submitted to the professor for grading and forwarded to the Academic Office at the end of the semester. No grade will be assigned until the final report has been reviewed and approved by Dr. Sanborn. All special problems are graded pass/fail.

RULES AND REGULATIONS

Academic Standing

The minimum grade point average for good academic standing is 1.7 for freshmen, 1.8 for sophomores, 1.95 for juniors, and 2.0 for seniors. Any student who has an overall scholastic average below the minimum requirement or whose average for a given semester falls below the minimum requirement will be placed on academic warning and will be limited to a maximum load of sixteen credit hours. A student on warning whose average for any semester falls below the minimum requirement for good standing will be placed on academic probation and will be limited to a maximum schedule load of fourteen credit hours. **A student on probation whose average in any semester falls below the minimum requirements will be dropped for unsatisfactory scholarship. A student whose average for any semester is below 1.0 may be placed on academic probation or dropped regardless of their previous record.**

Change of Major


REQUEST FOR CHANGE OF
ACADEMIC MAJOR, MINOR, CLASSIFICATION

Except for freshmen, the **minimum requirements** for admission to the Mechanical Engineering or the Nuclear and Radiological Engineering program from another school or department at Georgia Tech are:

A GPA of 2.6 or better in GT courses, and
Grades of C or better in required math and science courses.

To change from ME or NRE to another major, check with the other school or department to determine the requirements for admission to that program. Once approval has been obtained, complete a **Change of Major** form, secure signatures from both the new and the former schools, and present the form to the Registrar's Office in the Tech Tower. See Ms. Blue in the Academic Office to obtain a signature.

Dropped for Unsatisfactory Scholarship

If you have been dropped for unsatisfactory scholarship you will not normally be readmitted. However, if you seek readmission, you must petition the Institute Undergraduate Curriculum Committee. If you are readmitted into the Woodruff School you must demonstrate the potential for greatly improved academic performance. Before applying for readmission we strongly encourage you to complete at least two semesters of work at another accredited institution. At least half of these courses may be Humanities courses. An additional semester of absence from campus may be required to allow time for evaluation of your qualifications for readmission. This evaluation will include an academic review with Kimberly Blue, the Academic Advisor, and submission of completed transcripts from the other school.

If readmission is recommended, you will be asked to sign a contract which will include a program of study and a requirement for a minimum, overall grade point average of 2.0 at the end of the period covered by the contract. (Contracts typically run for two semesters, but may be extended for an additional semester if you take fewer than 12 hours per semester.)

Failure to meet any part of the contract will result in your dismissal from the Institute with the understanding that no attempt will be made to seek further readmission to the Woodruff School of

Mechanical Engineering. Section VIII, B.6 of the Student Rules and Regulations states: "A student who is dropped a second time for unsatisfactory scholarship will not be readmitted to the Institute."

Exam Policy

The Woodruff School adheres to the guidelines on quizzes and final exams set by the Academic Senate of the Institute as follows:

- Students should receive some performance evaluation before the published drop deadline.
- Quizzes are not to be given during the week preceding final examination. All quizzes are to be graded and returned on or before the last day of class preceding final exam week.
- Each regularly scheduled lecture course shall have a final exam, and it shall be administered at the time specified in the official final exam schedule as distributed by the Registrar.
- A request for a change in the final exam period for an individual student will not ordinarily be granted. The request must be justified in writing and submitted to the instructor at least a week before the scheduled exam period.
- A request for a change in the final exam period for a class must have the approval of the instructor and unanimous approval of the class as determined by secret ballot. The request must be submitted to the Associate Chair for Undergraduate Studies for his approval at least a week before the beginning of final exams.
- In the event a student has two examinations scheduled for the same period, it is the obligation of the instructor of the lower numbered course to resolve the conflict by giving a final exam to that student at a mutually satisfactory alternate time.
- In the event a student is scheduled to take three exams in the same day, it is the obligation of the instructor of the class scheduled for the middle exam period to give a final exam to that student at a mutually satisfactory alternate time.

Graduate Course Option

If you complete both the bachelor's and master's degrees in Mechanical Engineering or Nuclear Radiological Engineering at Georgia Tech, with the approval of the Woodruff School, you may use up to six credit hours of graduate-level course work for both degrees. To qualify for this option, you must complete your undergraduate degree with a cumulative grade point average of 3.5 or higher and complete the master's degree within a two-year period from the award date of your bachelor's degree. Thus, if you wish to pursue an M.S. degree, you can use graduate courses to fulfill the six hours of technical electives required in either the undergraduate ME or the NRE programs.

Incompletes

If you receive an incomplete in a course, you must satisfactorily complete the course work and arrange for the incomplete to be removed from your record by the end of the next semester for which you are registered. Otherwise, the grade will automatically be changed to an F. Clear the incomplete with your original professor. **Do not register again for the course.**

Maximum Academic Load

Students in good academic standing may take up to 21 credit hours in any fall or spring semester. Up to 16 hours may be taken in the summer semester. However, course loads of more than 18 hours are not advisable except for exceptionally talented students.

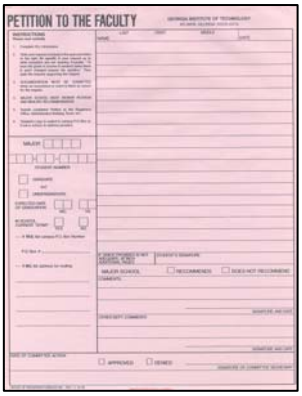
Pass/Fail

You may take certain courses on a **pass/fail** basis. The maximum accumulated number of pass/fail hours that can be applied toward a bachelor's degree depends on the total number of credit hours taken at Georgia Tech, according to:

45 to 70 credit hours	3 hours pass/fail
71 to 90 credit hours	6 hours pass/fail
91 or more credit hours	9 hours pass/fail

Pass/fail hours may be taken in excess of these limits, but the excess hours will not count toward the bachelor's degree.

In the Mechanical or Nuclear and Radiological Engineering curricula, the only courses that may be taken on a pass/fail basis are humanities and social sciences. There are two exceptions: the Economics and Engineering Ethics courses required for the degree must be taken for a letter grade. All nonhumanities and nonsocial science courses required for the degree must be taken for a letter grade.


PETITION TO THE FACULTY

Petitions to the Faculty

You may ask for relief from any of the Institute's rules and regulations by petitioning the Institute's Undergraduate Curriculum Committee. The **Petition to the Faculty** form is available in the Academic Office. Complete the form, obtain the recommendation and signature of Ms. Blue and submit the petition to the Registrar. Petitions are generally granted when you have been unjustly served by the regulations or when relief is requested from the consequences of a mistake over which you had no control. **Do not expect the faculty to protect you from the consequences of your own carelessness.**

Readmissions

We suggest that you consult with Ms. Blue before you begin this process. If, for any reason, you have remained out of school more than two semesters (including the summer), you must apply for readmission. A **completed Application for Readmission must be submitted to the Office of the Registrar (located in the Tech Tower) prior to the deadlines listed in the *General Catalog* or on the Academic Calendar**. It is your responsibility to allow sufficient time for the readmission process to be completed. Please note that the Woodruff School can only **recommend** a course of action; the final decision is made by the Institute's Undergraduate Curriculum Committee. See Ms. Blue for a signature on your form.

Repeating Courses

Courses that are passed with a grade of C or better normally may **not** be repeated. If you wish to repeat such a course, obtain approval **in writing** from your major department. Approval, in writing, of the department in which the course is offered is also required.

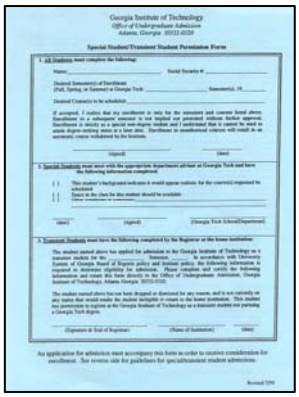
Ten-Year Rule

Courses completed more than ten years prior to your graduation must be validated by a special examination.

Thirty-Six-Hour Rule

The final 36 hours earned for a degree must be taken in residence at Georgia Tech.

Transfer Credit


Georgia Institute of Technology
Office of Undergraduate Admission
Atlanta, Georgia 30332-0320

Special Student/Transient Student Permission Form

Course work taken at another institution may be considered for transfer credit if it was passed with a grade of C or better, and it is not a substitute for a course previously failed at Georgia Tech. Transfer credit is granted by one of two means.

For most lower division courses the Admissions Office or the Office of the Registrar, will review a transcript and automatically give credit, based on a table of equivalency, for courses taken at other institutions. See

http://www.registrar.gatech.edu/TransferCredit.html

Otherwise, you must present evidence to the appropriate department at Georgia Tech that the nonresident course is equivalent to a course here. Bring all relevant materials (syllabus, textbook, catalog description, copies of exams, homework, etc.) to the department at Georgia Tech offering the course, and ask that a **Non-Resident Credit** form be completed and submitted to the Registrar. You should check at a later date to make sure the form reached the Registrar.

For ME and NRE students seeking transfer credit for courses in these disciplines, **Transfer Credit** forms can be picked up from the Academic Office. Please complete the form and leave copies (not originals) of the requested information as it will **not** be returned. Take materials and the completed form to Ms. Frank. You will be notified of the outcome of your request by an e-mail from Dr. David Sanborn.


APPLYING FOR ME/NRE TRANSFER CREDIT*

NOTE: PLEASE PRINT LEGIBLY. UNREADABLE FORMS WILL BE RETURNED TO THE STUDENT! INCOMPLETE SUBMISSIONS WILL DELAY THE PROCESSING OF YOUR REQUEST!!

In order to receive transfer credit from another college or university, you MUST provide, for each course:

1. A copy of the syllabus including a list of topics covered and catalog description.
2. A copy of the transcript from the school where you took the course, including the name and address of the school, the grade you received and an indication as to whether it's a quarter or semester grade.
3. The name of the textbook used.
4. Please fill in the following table:

Course Number	Course Name	Where Taken	When Taken	Grade	Request Credit For

REQUESTS FOR TRANSFER CREDIT WHICH DO NOT HAVE ALL OF THE ABOVE WILL BE RETURNED TO THE STUDENT.

4. Your name _____ Major _____
Student Number _____ Telephone Number _____
E-mail address _____ Campus PO _____

After you have collected ALL of this information, clip this sheet to the material being submitted and leave it with Ms. Norma Frank for Dr. Vito. You will be notified by e-mail or telephone regarding your request. Do NOT leave any information that you want returned! Please see Dr. Ray Vito in the School of Mechanical Engineering (M.E. Academic Office, Room 5112, MRDC Building) if you have any additional questions.

The approved transfers are found on the GSCAR web: http://www.gatech.edu/oscar-web/tm/

Transfer credit appears as the initial entry on a transcript. Where credit is granted for a course that has content identical to a Georgia Tech course, the Tech course number will be listed. If the credit is for a course that does not exactly match a Georgia Tech course in content or hours, the listing will be in a generic form, such as Math 3xxx.

Voluntary Withdrawal After Completion of Semester

If you are on **good standing** or **warning** status you may apply for readmission in any subsequent semester and expect positive action by the Registrar's Office.

If you are on **probation**, arrange for an interview with Ms. Blue to discuss your application for readmission. A positive recommendation will normally be given if there is a clear indication that the problems which led to your poor standing have been, or are being, rectified.

Voluntary Withdrawal with all W Grades

If you drop a class during a semester and receive all **W** grades, you are **not** be allowed to re-enter Georgia Tech the semester following withdrawal. In addition, the application for readmission must be accompanied by a letter explaining how the problems that led to your withdrawal have been resolved. If you are on probation at the time of withdrawal, you must schedule an academic review with Ms. Blue.

Withdrawal from a Course

You may withdraw from a course online without penalty any time during the first five weeks of a semester. The exact date of the last day that withdrawals can be accepted is published in the OSCAR. **Woodruff School students will not be permitted to drop more than three ME or NRE required courses except for documented, nonacademic reasons.**

The decision to drop a course is a serious one and should be made only after consultation with Ms. Blue. Numerous W's on a transcript are an indication of either poor planning, ineffective time management and/or study skills, or lack of ability to complete assigned tasks. Prospective employers and graduate schools will not look favorably upon a record with a pattern of frequent withdrawals. As a practical matter, withdrawal from a course can jeopardize your ability to complete the degree program as scheduled.

There is a restricted withdrawal policy for several Woodruff School courses. These are usually laboratory or other courses that require special departmental resources. Other courses with limited enrollments might be added to this list, and they will be so designated during registration. The courses are:

ME/CEE/AE 1770	Introduction to Engineering Graphics and Visualization
ME 2110	Creative Decisions and Design
ME 3056	Experimental Methodology Laboratory
ME 4053	Mechanical Engineering Systems Laboratory
ME 4182	Capstone Design Project
NRE 3112	Nuclear Radiation Detection
NRE 4206	Radiation Physics Lab
NRE 4232	Nuclear Radiological Engineering Design

A withdrawal from one of these courses will be granted only in the event of serious illness or comparable circumstance beyond the student's control. A **HOLD** will be placed on your registration which will require a meeting with Ms. Blue to discuss your reasons for dropping the class.

GRADUATION

Degree Petitions

To graduate, you must petition for a degree and pay a $25 diploma fee to the Cashier's Office in Lyman Hall. You can obtain the **Degree Petition** in the Academic Office. This petition must be completed the semester preceding the semester of your graduation and be at the Registrar's Office by the due date published in OSCARWEB. Ms. Blue will inform you of the due date to the Academic Office by e-mail. **You are strongly encouraged to turn in degree petitions early, so that the petition can be reviewed by Ms. Blue in time to resolve any deficiencies in your program during the drop/add period of your final semester.**

PETITION FOR DEGREE

IN ORDER TO CORRECTLY COMPLETE THE PETITION, PLEASE READ THE INSTRUCTIONS
REGISTRAR'S OFFICE CANNOT GUARANTEE ACCEPTANCE OF INCOMPLETE OR LATE PETITIONS

PETITION DEADLINE

RESPONSIBILITY OF STUDENT

PETITION INSTRUCTIONS

Undergraduate Petitioners Complete Sections: 1, 2, 3 and 4
Master's Degree Petitioners Complete Sections: 1, 2, 4 and the Master's Degree Program of Study (separate form)
Doctoral Degree Petitioners Complete Sections: 1, 2 and 4 only

INFORMATION SOURCES FOR THE PETITION PROCESS AND COMMENCEMENT

REMOVE STUDENT COPY (WHITE) AND DEPARTMENT COPY (GREEN) BEFORE SUBMITTING FORM TO REGISTRAR'S OFFICE

If you **do not** graduate in the semester for which you petitioned, you will need to reactivate your petition when you are ready to graduate. Reactivated petitions require an additional $25 diploma fee. The petition may be submitted to the Academic Office for review and forwarded to the Registrar's Office no later than the end of the first week of classes of your final semester.

Checklists

Use the ME and NRE checklists to track your progress toward graduation.

Degree Petition Check Sheet
B.S.N.R.E. Degree - 2002-2003

Degree Petition Check Sheet
B.S.M.E. Degree - 2002-2003

Graduation with Academic Distinction

For graduation with highest honors, the minimum scholastic average is 3.55, for graduation with high honor, the minimum scholastic average is 3.35, and for graduation with honor, the minimum scholastic average is 3.15. Please refer to the *Georgia Tech General Catalog* for additional requirements.

B.S.M.E. Degree Petition Checklist for 2002 – 2003

Designated Courses (94 hours)

Chem 1310 _____
Science _____
CHEM 1311 _____
AND
CHEM 1312 _____
OR one of the following:
BIOL 1510 _____
BIOL 1520 _____
EAS 1600 _____
EAS 1601 _____
PHYS 2213 _____
Math 1501 _____
Math 1502 _____
Math 2401 _____
Math 2403 _____
Math/ISYE 3770 _____

Phys 2211 _____
Phys 2212 _____

ECE 3710 _____
ECE 3741 _____
ECE 3301 _____
CS 1321 _____

ISYE 3025 _____
MSE 2001 _____
ME/CE/AE 1770 _____

ME 2016 _____
ME 2110 _____
ME 2211 _____
ME 2202 _____
ME 3015 _____
ME 3056 _____
ME 3180 _____
ME 3201 _____
ME 3322 _____
ME 3340 _____
ME 3345 _____
ME 4053 _____
ME 4055 _____
ME 4182 _____
ME 4210 _____
ME 4315 _____

Elective Courses (32 hours)

Humanities (12 hours)
ENGL 1101 _____
ENGL 1102 _____
Engineering Ethics
Choose one
PST 3105 _____
PST 3109 _____
PST 3127 _____
PST 4176 _____
Humanities Elective _____

Social Sciences (12 hours)
Economics
Choose one
ECON 2100 _____
ECON 2105 _____
ECON 2106 _____
HIST/POL SCI Requirements
Choose one
HIST 2111 _____
HIST 2112 _____
POL 1101 _____
PUBP 3000 _____
INTA 1200 _____
Social Science Elective _____
Social Science Elective _____

Technical Electives (6 hours)
_____
_____

Wellness
Choose one
HPS 1040 _____
HPS 1062 _____
HPS 1063 _____
HPS 1064 _____

Hours

Check

Hours earned at Georgia Tech _____

Nonresident credits _____

Current and last semester's credits _____

Total _____

Minus extra hours _____

Net credits (126)

B.S.N.R.E. Degree Petition Checklist for 2002 – 2003

Designated Courses (91 hours)

Chem 1310 _____

Math 1501 _____
Math 1502 _____
Math 2401 _____
Math 2403 _____
Math 4581 _____

MSE 2001 _____

ME 2211 _____
ME 3201 _____
ME 3322 _____
ME 3340 _____
ME 3345 _____

PHYS 2211 _____
PHYS 2212 _____
PHYS 2213 _____
NRE 3301 _____
ECE 3301 _____
ECE 3710 _____
ECE 3741 _____
CS 1321_____
ISYE 3025_____

NRE 2110_____
NRE 3112_____
NRE 3212_____

NRE 3316_____
NRE 4204_____
NRE 4206_____
NRE 4214_____
NRE 4232_____
NRE 4328_____
NRE 47XX_____

Elective Courses (35 Hours)

Humanities (12 hours)
ENGL 1101_____
ENGL 1102_____
Engineering Ethics
Choose one
PST 3105_____
PST 3109_____
PST 3127_____
PST 4176_____
Humanities Elective_____

Social Sciences (12 hours)
HIST/POL SCI Requirements
Choose one
HIST 2111_____
HIST 2112_____
POL 1101_____
PUBP 3000_____
INTA 1200_____
Economics
Choose one
ECON 2100_____
ECON 2105_____
ECON 2106_____
Social Science Elective_____
Social Science Elective_____

Technical Electives (9 hours)
_____
_____
_____

Wellness (2 hours)
Choose one
HPS 1040_____
HPS 1062_____
HPS 1063_____
HPS 1064_____

Hours Check

Hours earned at Georgia Tech _____

Nonresident credits _____

Current and last semester's credits_____

Total _____

Minus extra hours_____

Net credits (126)_____

CAREERS

A major in mechanical engineering will give you a lot of options for finding a job. For the past few years the placement rate has been excellent for Woodruff School graduates. The Career Services Office (in the Moore Student Success Center) sponsors career fairs, and there are about than 1,000 company visits to campus each academic year, with most employers looking to hire mechanical engineers.

For information on student and employer services, view

http://www.career.gatech.edu

Those Woodruff School students who go to graduate school get accepted at many top-ten schools. Almost 20 percent of our graduating seniors go directly to graduate or professional school, and the remaining 80 percent go into industry, where the starting salaries for mechanical engineers are excellent.

You are invited to make use of the Career Center's Computerized Systematic Interactive Guidance and Information System (SIGI) for assistance in determining career interests and aptitude and the Computer Assisted Study Skills Instruction (CASSI) for improving study skills. The center also offers personal counseling to assist you in dealing with personal, motivational, or study problems. Counselors are available for individual sessions by appointment (404-894-2575).

FINANCIAL AID

Scholarships and Awards

Many awards recognize academic achievement and outstanding service to the School, the College, and the Institute. Many students at Georgia Tech hold HOPE scholarships, a program funded from Georgia lottery proceeds. In addition, a number of Woodruff School students have received President's Scholarships. These students have demonstrated excellence in leadership and academics, and receive financial awards for four years. Students are expected to maintain honors-level academic performance, and to be involved in campus or community activities. The Office of Student Financial Planning & Services is located on the 3rd floor of the Student Success Center, located next to the Tech Tower and adjoining the football stadium. Hours are Monday through Friday from 8 AM - 4:30 PM.

http://www.enrollment.gatech.edu/finaid/hope.htm
or
http://www.enrollment.gatech.edu/finaid/aidcontacts.html#5

Student Honors Day is another source of awards for Woodruff School students. Awards typically given by the School include the Woodruff School Chair's Award (to a graduating senior), the Pi Tau Sigma Outstanding Senior Award, the Samuel P. Eschenbach Memorial Award in Mechanical Engineering (based on scholarship, leadership, and promise as a mechanical engineer), the Woodruff School of Mechanical Engineering Outstanding Scholar Award, the Richard K. Whitehead Memorial Award (to an outstanding senior), and the Pi Tau Sigma Outstanding Sophomore Award. Also, Woodruff School students may receive awards given by the College of Engineering.

Because of its strong ties with industry, government, and foundations, the Woodruff School attracts an unusual number of scholarship opportunities. The School makes every attempt to nominate its exceptional students by matching their qualifications as closely as possible to the spirit and requirements of each award. **To provide the School with information about your background, goals, honors, and personal interests, particularly if interested in being considered for a scholarship or award, you should submit a résumé to the Academic Office.** These résumés should be updated periodically and reviewed with Ms. Blue. In addition to the résumé, Ms. Blue may also request an interview with scholarship candidates.

Nuclear Engineering Scholarships

Unique scholarship opportunities exist for Georgia Tech BSNRE students. In addition to national NRE scholarships sponsored by the National Academy for Nuclear Training, the U. S. Department of Energy, and some professional societies, Georgia Tech offers scholarships sponsored by local industry, as well as the prestigious George W. Woodruff NRE Scholarship.

Academic Common Market (ACM)

The ACM provides an exciting opportunity for students from the southeast whose state universities do not offer a BSNRE degree. Students from those states who are accepted to the BSNRE program at Georgia Tech pay (Georgia) in-state tuition and must maintain ACM status. For more information, view

http://www.me.gatech.edu/me/publicat/flyers/BSNRE-ACM.html

Other Financial Aid Sources

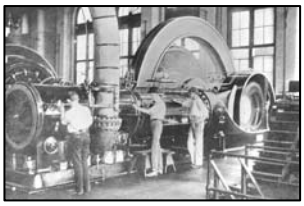
If you need to take out a loan, U. S. (Stafford) and State Government loans are available to American citizens and permanent residents only; they require advance planning. Contact the

Office of Student Financial Planning
Georgia Institute of Technology
Atlanta, Georgia 30332-0460

or call 404-894-4160 for more information.

SPECIAL PROGRAMS

The Cooperative Program



Since 1912, Georgia Tech has offered a five-year cooperative program to those students who wish to combine career-related experience with classroom studies. The program is the fourth oldest of its kind in the world and the largest optional co-op program in the country. The program alternates between industrial assignments and classroom studies on a semester basis for two of the four years. If you participate in the cooperative program, you will receive the degree Bachelor of Science in Mechanical Engineering or Nuclear and Radiological Engineering, Cooperative Plan. You will then have completed the same course work as that completed by regular four-year students.

While on work semesters, you can receive academic advice by telephoning Ms. Blue at 404-894-3205. It is important to check periodically with the Academic Office to make sure you know about any revisions in Woodruff School course schedules or curriculum.

For more information or to apply for admission to the cooperative program contact the Cooperative Division Office in the Savant Building at 404-894-3320 or view

http://www.coop.gatech.edu/

Tutoring Programs

Academic Tutoring Program in the Woodruff School

The Academic Tutoring Program in the Woodruff School is organized by Pi Tau Sigma, an honorary society in mechanical engineering. WSSAC students and the United Technology Teaching Interns also serve as tutors for many required courses in mechanical engineering. The list of specific courses is available in the Academic Office or call Pi Tau Sigma at 404-894-4000 for times and availability of tutors. An area in the MRDC Building on the 2nd floor (near the elevator) is reserved for this program.

Learning Resources

Learning Resources is a free tutorial service provided by Georgia Tech. One-on-one tutoring in calculus, physics, and chemistry is available. For information, call 404-894-1945.

Office of Minority Educational Development (OMED)

OMED offers a free tutorial service to undergraduates. Tutoring, which occurs in the Library, is available in mathematics, science, and many engineering courses. For information, call 404-894-3959.

School of Mathematics

The School of Mathematics provides a walk-in tutoring service in the Math Lab (Room 257 of the Skiles Building) for any Georgia Tech student in a freshman-level mathematics course. The hours are posted each semester.

One-to-One Tutoring, Success Programs

This is a tutoring service in the core mathematics, computer science, physics, and chemistry courses. Go to Room 105 in the ESM Building during the day. For an appointment, go to

http://lotus.stucen.gatech.edu/1to1/

The Frank K. Webb Program in Professional Communication

The Frank K. Webb Professional Communication Program provides classroom instruction, evaluation guidelines, and models of good performances for students who are learning how to prepare written and oral technical reports. Dr. Jeffrey Donnell participates in the Woodruff School's design and laboratory courses; he explains how technical reports work and he grades many written and oral performances. Among his classroom activities at the Woodruff School are:

- Lectures on report preparation for undergraduate design and laboratory courses;
- Prepares instructional guides and example reports; and
- Evaluates and provides feedback on written and oral reports.

As you prepare to graduate from Georgia Tech, Dr. Donnell will help you to develop career-related documents:

- Lectures on the graduate application process and model application essays;
- Provides model graduate fellowships application essays;
- Reviews student application essays;
- Reviews student résumés and cover letters; and
- Reviews other class performances and reports, as well as reports prepared for independent research projects.

The program was created in 1990 and is one of the few writing programs of its kind in an engineering department. The program, which is based on the University of Chicago's *Little Red Schoolhouse* program to teach clear writing and effective composition, is coordinated by Dr. Jeffrey Donnell, who has a doctoral degree in English from Emory University. The program formalizes the oral and written reports that are part of the School's design and lab courses. Communications activities are framed as career-development activities, and they are coordinated across the Woodruff School curriculum, beginning with the first design course.

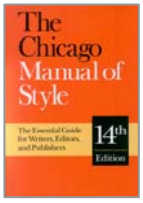
http://www.me.gatech.edu/me/academics/little_red_schoolhouse/

The various design and laboratory classes devote one or two class sessions to lectures on communications issues. In addition, design classes devote a few minutes of class time each week to oral presentations and to feedback on these presentations. You will also learn how to prepare project documentation.

Sources for Preparing a Professional Presentation

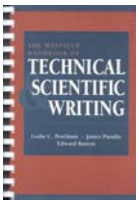
To help you prepare the results of your lab and design work in written form, here are some useful tools that discuss style, grammar, and writing skills. These books may be found in the Georgia Tech Library or they might be purchased in any bookstore.

Style

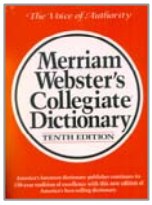


Chicago Manual of Style, 14th edition. The University of Chicago Press, Chicago, Illinois, 1993.

The Mayfield Handbook of Technical & Scientific Writing, L. Perelman, J. Paradis, and E. Barrett, editors. Mayfield Publishing, Mountain View, California, 1988.

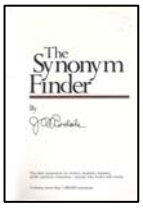


Dictionaries



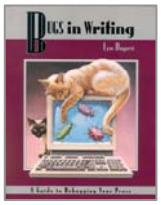
Merriam Webster's Collegiate Dictionary, Tenth Edition, Merriam-Webster, Inc., Springfield, Massachusetts, 1996.

The Synonym Finder, J. I. Rodale. Rodale Press, Emmaus, Pennsylvania, 1978.



Grammar

Bugs in Writing, Lyn Dupre. Addison Wesley Publishing Co., Reading, Massachusetts, 1995.



<u>The Five-Year BS/MS Program</u>

The Woodruff School offers a five-year BS/MS Program for outstanding Woodruff School students who want to obtain a graduate degree. You can obtain your degrees in various combinations, such as a B.S. and M.S. in ME or a B.S. in NRE and an MS in ME. To learn if you are eligible for this individualized program, view

http://www.me.gatech.edu/publicat/brochures/bsms.htm

<u>The United Technologies Teaching Intern Program</u>

This program is funded by the United Technologies Corporation and supports up to seven junior and senior mechanical engineering students for two semesters. Students are invited into the program based on academic achievement

and recommendations by the faculty. The program is intended to give students the opportunity to work with a faculty member in teaching an undergraduate course in mechanical engineering; encourage our best students to consider graduate school; help develop communication and interpersonal skills; and provide a way for practicing engineers and managers at United Technologies to interact with Woodruff School students. The teaching interns participate as tutors in the Woodruff School's Academic Tutoring Program. For more information, contact Dr. David Sanborn at david.sanborn@me.gatech.edu.

Undergraduate Research

It may help your career planning to get involved in undergraduate research. If you are interested in doing a research project for credit or pay (but not both) we encourage you to speak with faculty members or send a request to Ms. Blue or Dr. Sanborn. As a rule, undergraduate research done for credit is performed as a special problems course (ME 4901) for up to four credit hours. Additionally, the Undergraduate Research Fair, sponsored by WSSAC in the fall, gives you the opportunity to meet with faculty members who have research projects for you to perform.

Studying Abroad

There are three undergraduate study-abroad programs: Georgia Tech Lorraine in Metz, France; Worcester College at Oxford University (England); and the Australia-New Zealand Study Program. The classes at Georgia Tech Lorraine are taught in English by Georgia Tech faculty members. For more information about these opportunities, contact International Student Programs at 404-894-7475. View

http://www.me.gatech.edu/me/gtl/GTL.html
or
http://www.ece.gatech.edu/academic/oxford/

Dual-Degree Program

The dual-degree program allows you to combine a typical liberal arts program with the technological curriculum offered by Georgia Tech. Under this program, you attend a liberal arts college for three years and then come to Georgia Tech for two years. Upon completion of the program, you receive both a bachelor of arts or science degree from the liberal arts college and a bachelor's of science degree in an engineering or science field from Georgia Tech. Most of the colleges and universities of the University System of Georgia, the Atlanta University Center colleges, and other selected colleges and universities from around the nation participate in this program.

As a dual-degree student you do not formally transfer credits upon matriculation to Georgia Tech, but you are considered a transfer student and must satisfy **all** the requirements of the BSME or BSNRE program. During the registration period for the first semester of residence at Georgia Tech, you should meet with Ms. Blue to arrange the initial semester's schedule. She will evaluate your transcript for compatibility with Georgia Tech's Mechanical Engineering or Nuclear and Radiological Engineering program and fill out a program of study.

A Second Undergraduate Degree

The second undergraduate degree option is available for those who have received an undergraduate degree in another discipline at Georgia Tech or from some other school. To earn a BSME or BSNRE degree, you must satisfy all the requirements of either the Mechanical Engineering or the Nuclear and Radiological Engineering program including a minimum of 36 semester hours in excess of the requirements for the first degree.

Fundamentals of Engineering Exam

The Georgia State Board of Registration offers Georgia Tech students the opportunity to take the Fundamentals of Engineering (FE) exam before they graduate, a privilege not normally afforded to the general public. The exam is given twice a year, usually in April and October. Students who are within two semesters of graduation and want to take the exam must fill out the application before the deadlines established by the Georgia State Board. The applications, available in the Academic Office, must contain a recent picture of the applicant, be typed, notarized, and signed by five references, three of whom must be registered Professional Engineers. The names of Notary Publics and Professional Engineers in the Woodruff School are available in the Academic Office. You are encouraged to take this exam in your senior year.

FACILITIES

We believe the Woodruff School has the finest mechanical engineering facilities in the United States. Most of the Woodruff School is housed in a three-building complex, all built after 1990, with classroom, laboratory, and research space.

The Manufacturing Related Disciplines Complex (MRDC) houses the Administrative, Finance, and Academic Offices, many undergraduate laboratories, and some classrooms.

Our newest building, the J. Erskine Love Jr. Manufacturing Building, houses state-of-the-art research laboratories, classrooms, and office space.

The Manufacturing Research Center (MARC) houses a high-bay area with an anechoic (echo-free) chamber and other research equipment and office space.

Our bioengineering faculty are located in the Parker H. Petit Institute for Bioengineering and Bioscience, and the nuclear and radiological engineering faculty are located in the Neely Research Center.

All facilities are connected to the campus fiber optic network and the Internet. Our machine and instrumentation shops are supported by a staff of full-time technicians, and there is a full-time coordinator for the undergraduate laboratories.

Computers

Shortly after you enter Georgia Tech, the Office of Information Technology (OIT) will create a user ID and password, usually referred to as a "prism" account, for the campus mainframe computer, a Sun Sparc Center 2000, usually referred to as "acme." These accounts provide a UNIX programming environment, an e-mail account, home page location, and other services. The prism account is the official Georgia Tech e-mail account used for students. You can obtain a user-name and password in Room 140 of the Rich Building.

Computer Clusters

The Woodruff School maintains two computer clusters for student use. The General Use Computing Cluster (MRDC, Room 2104) has 18 PC compatible multimedia computers with zip drives, CD-Writers and 2l inch monitors, two Lexmark Optra S 24ppm laser printers, and an HP flatbed scanner with document feeder available for student use. Software installed on the machines include Word, Excel, PowerPoint, Access, Netscape, Matlab, Autocad, Engineering Equation Solver, and Cambridge Materials Selector. You can log-in using your prism account. This cluster is accessible with your buzz card 24/7. Staffed hours are posted outside the door. All Woodruff

School students should be programmed for access. If you are not, see the staff in MRDC, Room 2321 or phone 404-894-6824.

The Computer Aided Engineering (CAE) laboratory (MRDC, Room 2105) houses 27 higher end PC compatible multimedia computers with zip drives, CD-Writers, and 20 inch flat panel monitors, a Lexmark 11x17 24ppm laser printer, an HP 4500 color laser printer, a Lexmark color laser printer, and an HP 755CM large format plotter. This cluster is reserved for classes and students using IDEAS, Fluent, or ANSYS modeling and analysis software. The cluster remains locked 24 hours a day with access via buzz cards only to authorized students. You must be in a class that needs these software packages or have special approval from a faculty member to use the lab. Requests to use the CAE can be made to

http://www2.me.gatech.edu/caecluster/cae_request.asp

Using the School's Computers

Computer facilities are available only to serve needs directly related to class assignments and academic research. **The facilities are not for personal use**. Use of computer resources to prepare personal letters, print résumés, play games, consulting activities, or for other commercial uses is a violation of Institute policy. Anyone caught not doing legitimate work may be asked by a user assistant to relinquish his or her seat in the cluster.

Wireless/Walkup Network (LAWN)

The purpose of the Georgia Tech Wireless/Walkup Network (LAWN) is to connect in common areas of the buildings where there is normally no access. OIT supports the LAWN from 8 a.m. to 5 p.m. Monday through Friday. There are instructions to connect to the LAWN in the lobbies of the Love and MRDC buildings and online. System requirements and instructions also can be found online at

http://www.me.gatech.edu/support/computer/LAWN/lawnpage.html

For additional assistance with connecting to the wireless or walkup network, please contact the help desk at 404-894-7193, or computer.support@me.gatech.edu, or go to MRDC, Room 3329.

Copy and Fax Machines

A copy machine and a FAX machine, both reserved for student use, are located in the second floor lobby of the MRDC Building.

Shops and Laboratories

The Machine Shop, the Fabrication Shop, and the Electronics Shop are valuable Woodruff School resources. Most of the construction in these shops is done by the professional staff.

The Machine Shop

If you have the appropriate skills, you may be allowed to use the Machine Shop (MRDC, Room 2327). Prior, you will be asked to attend a machine shop safety training class or to demonstrate appropriate skills to shop personnel. Fill out a **Machine Shop Student Work Request**. This form

contains a **Waiver of Liability,** and must be signed by your advisor and submitted to the machine shop manager prior to using the machines. This form is located outside of Room 2205 in the MRDC Building or online at

www.me.gatech.edu/support/work_request_index.html

For more information about the student machine shop, contact Mr. John Graham at (404) 894-3216 or at john.graham@me.gatech.edu.

The Fabrication Shop

Typically, the Fabrication Shop, which is located in Room 2317 of the MRDC Building, is not open for student use. However, if you have a specific request or need, then permission to use the shop will be granted while a member of the professional staff is present. Some prior knowledge of the equipment in the shop is necessary before such use. For more information, contact Mr. Butch Cabe at (404) 894-3219 or donald.cabe@me.gatech.edu.

The Electronics Lab

The Electronics Lab is located in Room 2211 of the MRDC Building. You are not allowed in this lab unless a staff member is present. Work performed in the Electronics Lab must be related to funded research, thesis work, or course work. Contact Mr. Vladimir Bortkevich at (404) 894-7671 or at vladimir.bortkevich@me.gatech.edu to discuss your requirements. For more information, see

http://www.me.gatech.edu/support/electronics

FACULTY

The Woodruff School has 70 tenure-track faculty (all with Ph.D.'s), eighteen research faculty, three academic professionals, and fifty staff members. Thirteen faculty members hold endowed chairs or distinguished professorships.

Many of our faculty have received prestigious awards, written widely-used textbooks, and are well known in their respective areas of expertise. Twenty-one faculty members have received prestigious National Science Foundation Career Awards; at least 30 hold the grade of Fellow in professional societies, such as the ASME; and faculty members hold more than 140 patents.

Your interaction with faculty, both in and out of the classroom is an important part of your education. You are strongly encouraged to take advantage of the opportunities to meet with the faculty, just as faculty members are encouraged to include students to the maximum extent possible in research and other learning experiences. You may e-mail any faculty member by using

first name.last name@me.gatech.edu

View the individual faculty web pages at

http://www.me.gatech.edu/me/people/academic.faculty/index.html

Acoustics and Dynamics

Yves H. Berthelot, Professor Acoustics, laser instrumentation in acoustics, ultrasonics	Love 124 4-7482
Kenneth A. Cunefare, Associate Professor Active/passive control, modeling and control of brake squeal, fluid-structure interaction, and optimal acoustic design	Love 113 4-4726
Aldo A. Ferri, Associate Professor Acoustics, structural dynamics, nonlinear dynamics and control	Love 107 4-9032
Jerry H. Ginsberg, George W. Woodruff Chair in Mechanical Systems and Professor of Mechanical Engineering Vibrations, acoustics, dynamics, fluid-structure interaction	Love 101 4-3265
Thomas Michael, Associate Professor (Joint Appointment) Measurement technology, ultrasonics, systems and controls	
Peter H. Rogers, Rae and Frank Neely Professor in Mechanical Engineering Underwater acoustics and bioacoustics	Love 118 4-3235

Automation and Mechatronics

Wayne J. Book, HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control and Professor in Mechanical Engineering Robotics, automation, modeling fluid power, and motion control	Love 202 4-3247
Ye-Hwa Chen, Associate Professor Controls, manufacturing systems, neural networks, fuzzy engineering	MARC 440 4-3210

Imme Ebert-Uphoff, Assistant Professor — MARC 476
Robotics, theoretical kinematics, dynamics, parallel manipulators, and digital clay — 5-0667

Kok-Meng Lee, Professor — MARC 474
System dynamics, control, automation, optomechatronics — 4-7402

Harvey Lipkin, Associate Professor — Love 214
Design and analysis of mechanical systems, robotics, spatial mechanisms — 4-7410

John G. Papastavridis, Associate Professor — Love 132
Analytical, structural/nonlinear mechanics, vibrations, and stability — 4-2789

Nader Sadegh, Associate Professor — MARC 475
Controls, vibrations, design — 4-8172

William Singhose, Assistant Professor — MARC 432
Vibration, flexible dynamics, command generation — 5-0668

Bioengineering

Andrés García, Assistant Professor — IBB 2314
Cellular and tissue engineering, cell adhesion, biomaterials — 4-9384

Robert Guldberg, Associate Professor — IBB 2311
Biomechanics, microCT imaging and tissue engineering — 4-6589

Jens O. M. Karlsson, Associate Professor — Love 005
Thermodynamics and transport in biological systems, nonequilibrium solidification, tissue engineering, and bioMEMS — 5-4157

David N. Ku, Lawrence P. Huang Endowed Chair in Engineering and Entrepreneurship and Regent's Professor — IBB 2307
Thrombosis, biomaterials, and tissue engineering — 4-6827

Marc Levenston, Assistant Professor — IBB 2312
Orthopedic biomechanics, soft tissue mechanics, tissue engineering — 4-4219

Robert M. Nerem, Parker H. Petit Distinguished Chair for Engineering in Medicine and Institute Professor — IBB 1106/1305
Biomedical engineering, cellular and tissue engineering — 4-2768

Raymond P. Vito, Professor — IBB 2305
Biomechanics, tissue mechanics, and design — 4-2792

Timothy Wick, Associate Professor (Joint Appointment) — IBB 1310
Tissue engineering, bioprocess engineering, bioreactor design, cell adhesion, blood rheology — 4-8795

Ajit Yoganathan, Regents' Professor (Joint Appointment) — IBB 2303
Cardiovascular fluid dynamics, rheology, Doppler ultrasound, and MRI — 4-2849

Cheng Zhu, Professor — IBB 1308
Biomechanics of single cells and single molecules, cell adhesion — 4-3269
Kinetics, Bio-MEMS, with applications to immunology and tumor biology

Computer-Aided Engineering and Design

Bert Bras, Associate Professor Environmentally conscious design, design for recycling, robust design	MARC 253 4-9667
Robert E. Fulton, Professor Finite element methods, structural mechanics, integrated CAD/CAM, electronic commerce, information management	MARC 451 4-7409
Farrokh Mistree, Professor Strategic design, design of product families and distributed design and manufacture	MARC 262 4-8412
Christiaan Paredis, Assistant Professor Simulation-based design, information technology for design, mechatronics, and evolutionary algorithms	MARC 256 4-5613
David W. Rosen, Associate Professor Virtual and rapid prototyping, intelligent CAD/CAM/CAE	MARC 252 4-9668
Suresh K. Sitaraman, Associate Professor CAD/CAE electronic packaging, thermomechanics and reliability, FEM	MARC 471 4-3405

Fluid Mechanics

Cyrus Aiden, Adjunct Professor (Joint Appointment) Hydrodynamic stability, liquid coating suspended particle hydrodynamics	IPST 4-6645
Ari Glezer, George W. Woodruff Chair in Thermal Systems and Professor of Mechanical Engineering Fluid mechanics, turbulent shear flows, flow control, diagnostics	Love 239 4-3266
G. Paul Neitzel, Professor Hydrodynamic stability, free-surface, and rotating and bioreactor noncoalescence	Love 229 4-3242
Marc K. Smith, Associate Professor Hydrodynamic stability, liquid films, droplet atomization	Love 237 4-3826
Minami Yoda, Associate Professor Experimental fluid mechanics, suspension flows, nano- and microfluids, and optimal diagnostics	Love 228 4-6838

Heat Transfer, Combustion and Energy Systems

Said I. Abdel-Khalik, Southern Nuclear Distinguished Professor Microscale, heat transfer, reactor safety, thermal hydraulics	Love 324 4-3719
Andrei Fedorov, Assistant Professor Catalysis and fuel cells, chemical and electrochemical sensors, Atomic force microscopy, and thermal radiation	Love 307 5-1356
Mostafa Ghiaasiaan, Professor Multiphase flow, aerosol and particle transport, nuclear reactor thermal-hydraulics, microscale heat transfer	Love 308 4-3746
James G. Hartley, Professor	Love 340

Heat transfer, thermodynamics, fluid mechanics	4-3248
Sheldon M. Jeter, Associate Professor Thermodynamics, energy systems, and heat transfer	Love 330 4-3211
Yogendra K. Joshi, Professor Thermo-fluid issues in emerging technologies and microthermal systems	Love 338 5-2810
William R. King, Assistant Professor Microscale heat transfer, microfluidics, MEMS, atomic force Microscopy, polymers and advanced materials processing for micro/nanofabrication	Love, 206 5-4224
Samuel V. Shelton, Associate Professor Energy systems, HVAC systems, absorption, refrigeration	Love 216 4-3289
William J. Wepfer, Professor and Associate Chair for Graduate Studies Thermodynamics and heat transfer	MRDC 3105 4-3204
Zhuomin Zhang, Associate Professor Microscale heat transfer, thermophysical properties, and radiation thermometry	Love, 343 4-3759
Ben Zinn, David S. Lewis Jr. Chair in Aerospace Engineering and Regents' Professor (Joint Appointment) Combustion instability, active control, microscale combustion, propulsion, acoustics	Knight 365G 4-3033
<u>Manufacturing</u>	
Daniel F. Baldwin, Associate Professor Manufacturing systems design, electronics manufacturing and packaging polymer processing	MARC 432 4-4135
Jonathan S. Colton, Professor Manufacturing, polymer and composites processing, design, rapid prototyping	MARC 434 4-7407
Steven Danyluk, Morris M. Bryan Jr. Chair in Advanced Manufacturing Systems and Professor of Mechanical Engineering Materials processing, lubricant-surface interaction, polishing sensors	MARC 313 4-9687
Thomas R. Kurfess, Professor System dynamics, control, metrology, precision system design, and CAD/CAM/CAE	MARC 435 4-0301
Steven Y. Liang, Professor Automated manufacturing, controls systems, digital signal processing	MARC 438 4-8164
Shreyes N. Melkote, Assistant Professor Machining processes modeling, surfaces, CAM/CAPP, intelligent fixturing	MARC 437 4-8499
I. Charles I. Ume, Professor	MARC 453

Electronic packaging, mechatronics, laser moiré and laser ultrasonics — 4-7411

Mechanics of Materials

Iwona Jasiuk, Professor — MRDC 4110
Micromechanics, fracture, damage mechanics, composite materials, biomaterials — 4-6597

Steve Johnson, Professor of Materials Science and Engineering (Joint Appointment) — Love 166, 4-3013
Fatigue, fracture mechanics, and durability of materials and structures

W. Jack Lackey, Professor — MARC 458
Ceramic and metallic coatings, composites, and rapid prototyping — 4-0573

Christopher S. Lynch, Associate Professor and Associate Chair for Administration — MRDC 3218 & 4105, 4-6871
Experimental mechanics, smart materials

David L. McDowell, Carter N. Paden, Jr. Distinguished Chair in Metals Processing and Regents' Professor — MRDC 4105, 4-5128
Material deformation and damage, constitutive laws, metals processing

Richard W. Neu, Associate Professor — MRDC 4102
Fatigue, deformation, and degradation of materials — 4-3074

Jianmin Qu, Professor — MRDC 4108
Fracture, composite materials, wave propagation, microelectronic packaging — 4-5687

Min Zhou, Associate Professor — MRDC 4109
Micro- and nano-scale behavior, continuum and molecular dynamics modeling, experimental/computational mechanics, dynamic behavior and fracture — 4-3294

Microelectromechanical Systems

F. Levent Degertekin, Assistant Professor — Love 320
Micromachined sensors and actuators, ultrasonics, atomic force microscopy, and nondestructive evaluation — 5-1357

Peter J. Hesketh, Professor
Microfabrication, micromachining, sensors, actuators, biosensors, microfluids — Love 317, 5-1358

Wenjing Ye, Assistant Professor
CAD design of MEMS, microfabrication and numerical analysis — Love 316, 5-1301

Nuclear and Radiological Engineering and Health Physics

Nolan E. Hertel, Professor — Neely 113
Radiation shielding, neutron dosimetry, radiological assessment, radioactive waste management, accelerator sources and applications, high-energy particle transport, dry storage of spent fuel, skyshine — 4-3717

Farzad Rahnema, Associate Chair of the Woodruff School, Chair of the Nuclear and Radiological Engineering and Health Physics Program, and Professor — Neely G104, 4-3731
Reactor physics, perturbation and variational methods, computational transport theory, criticality safety

Weston M. Stacey, Jr., Fuller E. Callaway Professor in Nuclear Engineering and Regents' Professor — Neely 106, 4-3714
Fusion engineering, plasma physics, reactor physics

C.-K. Chris Wang, Associate Professor — Neely 120, 4-3727
Radiation detection, radiation dosimetry, medical and industrial applications of ionizing radiations, and spent nuclear fuel measurements

Tribology

Itzhak Green, Professor — MRDC 4209, 4-6779
Hydrodynamic lubrication, vibrations, rotordynamics, fluid sealing, tribology, design and diagnostics

Richard F. Salant, Georgia Power Distinguished Professor in Mechanical Engineering — MRDC 4205, 4-3176
Fluid mechanics, fluid sealing, lubrication and tribology

Jeffrey L. Streator, Associate Professor — MRDC 4206, 4-2742
Computer-disk tribology, thin-film lubrication, capillarity and contact mechanics

Ward O. Winer, Eugene C. Gwaltney, Jr. Chair of the Woodruff School and Regents' Professor — MRDC 3214, 4-3200
High-pressure rheology, lubrication, tribology, thermomechanics, mechanical systems diagnostics

STUDENT ORGANIZATIONS

There are a number of groups for you to join. WSSAC is the umbrella organization in the Woodruff School and is open to all students. In addition, you will find student chapters of professional societies, honor societies, and student competition groups.

Woodruff School Student Advisory Committee (WSSAC) http://www.me.gatech.edu/sac/

The Student Advisory Committee is the best way to become part of the decision-making process in the Woodruff School. SAC advises the faculty and administration on issues that directly affect the students. Meetings are open to interested students. Each year they sponsor two major events: the Undergraduate Research Fair in the fall and the Woodruff School Spring Banquet in the spring. They publish a newsletter (*Mechanical Engineering News*) each semester, help interview candidates for faculty positions, and work to improve faculty and student relations.

WSSAC sponsors an annual **Undergraduate Research Fair**, whose purpose is to put undergraduate students who wish to do research or laboratory work in touch with a faculty member who might have work for them to do. Faculty members present an overview of their area.

The **ME Spring Banquet** is held annually to honor graduating seniors and to present the annual Woodruff School Distinguished Alumnus Award and the Distinguished Educator Award. The banquet is sponsored by the Woodruff School but the evening is planned and implemented by WSSAC students. Ms. Kimberly Blue and Dr. Ray Sanborn are advisors to the group.

Professional Societies

Several professional mechanical engineering societies have student chapters at Georgia Tech. These organizations offer you a unique opportunity to learn about the many facets of mechanical engineering, let you meet practicing professionals, and they also provide valuable service to the School. You are strongly encouraged to participate in one or more of these groups.

http://www.me.gatech.edu/me/students/organizations/

American Nuclear Society http://www.me.gatech.edu/ans/

The Georgia Tech Student Section of the American Nuclear Society (ANS) is the link for prospective nuclear engineers with their chosen profession. Membership provides students with a subscription to the Society magazine, Nuclear News, technical paper reprints at a reduced rate, and eligibility for special student loans and scholarships. The section holds monthly meetings which regularly feature presentations by practicing engineers. Dr. Farzad Rahnema is the faculty advisor.

American Society of Mechanical Engineers http://www.me.gatech.edu/asme/

The Georgia Tech Student Section of the American Society of Mechanical Engineers (ASME) is the link for prospective mechanical engineers with their chosen profession. Membership provides students with a subscription to the

Society magazine, *Mechanical Engineering*, technical paper reprints at a reduced rate, and eligibility for special student loans and scholarships. The section holds monthly meetings which regularly feature presentations by practicing engineers. The section also sponsors several annual events such as the Spring Picnic. Dr. Harvey Lipkin is the faculty advisor.

Society of Automotive Engineers http://www.me.gatech.edu/sae/

The Society of Automotive Engineers (SAE) is a specialized engineering society which strives to further research, development, design, manufacture, and utilization of vehicles which operate on land and sea, and in air and space. The Georgia Tech student section is one of the largest in the country and consequently is able to attract excellent speakers and presentations for its meetings, which are held four to six times a semester. GT Motorsports and GT Off-Road are subgroups of the section. Membership in the student section includes a subscription to the monthly technical journal, *Automotive Engineering*, and the opportunity to purchase the SAE Handbook at a greatly reduced price. Dr. Ken Cunefare is the faculty advisor.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers http://www.ashrae.org

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) is an international professional and technical society devoted to promoting the arts and sciences of heating, refrigerating, air-conditioning, ventilation, and allied technologies. The ASHRAE Student Chapter meets twice a semester to hear presentations and to discuss topics of current interest. Membership includes a subscription to the monthly magazine, *The ASHRAE Journal*, and entitles students to receive a free copy of latest version of *The ASHRAE Fundamentals Handbook*. Dr. Sheldon Jeter is the faculty advisor.

Honor Societies

Pi Tau Sigma http://www.me.gatech.edu/pts/

Pi Tau Sigma is the national honorary fraternity of mechanical engineers. Invitations to join are extended to junior and senior mechanical engineering students who have distinguished themselves by high academic achievement. The Georgia Tech Chapter holds several meetings a semester to organize its several service projects, such as providing tutoring services in basic Mechanical Engineering courses. Pi Tau Sigma also presents two awards each year to the outstanding Mechanical Engineering students in the sophomore and senior classes. Dr. Janet Allen is the faculty advisor.

Gamma Beta Phi http://cyberbuzz.gatech.edu/gbp/

The Gamma Beta Phi Society is an honor and service organization for students in colleges and universities in the United States. Membership at Georgia Tech is by invitation to students with a GPA of 3.3 or above. The organization is based on seven committees. Last year the Campus Service Committee was responsible for

tutoring projects and the Community Services Committee sent representatives to high schools to talk about college life. Ms. Norma Frank advises the group.

Tau Beta Pi http://www.cyberbuzz.gatech.edu/tbpi/

Engineering students who show superior scholarship and leadership as well as integrity and breadth of interest, both inside and outside of engineering, are recognized by Tau Beta Pi, the highest engineering honor society. Undergraduate students who rank in the top eighth of their junior class are considered for membership. Dr. William Sayle (ECE) is the faculty advisor.

Student Competition Groups

GT Motorsports http://www.me.gatech.edu/gtmotorsports/

GT Motorsports was founded in 1986 by a group of students who felt they could gain valuable experience by applying their classroom knowledge to real-world problems. Each academic year the team conceives, designs, builds, and tests a single seat formula race car to compete in the annual SAE Formula Competition in Pontiac, Michigan. The students, most of whom are ME's, are responsible for every aspect of the car, including fundraising to finance the program. Beginning in summer 2000, the team also competed in the international formula competition held in Birmingham, England. In 2001 and 2002, the team was the Overall Winner; also in 2002, they placed 3rd among 134 teams in the national competition in Detroit. Dr. Ken Cunefare is the faculty advisor.

GT Off-Road (Mini-Baja Team) http://cyberbuzz.gatech.edu/minibaja/

GT Off-Road is a group of mechanical engineering, industrial design, industrial engineering, and management students. The team designs and builds a single seat vehicle from scratch. Members are trained in machining skills and make the parts they design. The only standard for the competition is a 10 hp Briggs and Stratton engine. In June 2000 the team competed in their first competition. Mini-Baja racing is also under the auspices of SAE, but they race on a dirt track. Dr. Ken Cunefare is the faculty advisor.

RoboJackets http://robot.me.gatech.edu/~club/

RoboJackets competes in national and international robotics competitions, promotes robotics at Georgia Tech, and helps students learn skills necessary to build robots. Teams work on projects such as Battlebots (combative robots), computer-controlled walking robots, Dragon Con (smaller combative robots), and robot-in-a-bag (assembling a robot). The group also works with high schools and community groups as part of the FIRST competition. Dr. Imme Ebert-Uphoff is the faculty advisor for RoboJackets and Dr. Wayne Book is the FIRST faculty advisor.

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Georgia Institute of Technology

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