The George W. Woodruff School of Mechanical Engineering 2004-2005 Undergraduate Handbook

Programs in Mechanical Engineering and Nuclear and Radiological Engineering

Georgia Institute of Technology

(This Handbook was revised in December 2004. See, in particular, requirements in the undergraduate programs and academics, in rules and regulations).

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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 of the ten engineering divisions 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 now ranked 6th 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 (ASME) designated the Woodruff School a Mechanical Engineering Heritage Site. We are the only educational institution to receive this honor. Since 1971, only 225 sites, landmarks, and collections around the world have been designated by the ASME.

Accreditation

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). Our most recent accreditation review was done in 2002. The accreditation reports for our programs may be found at

www.me.gatech.edu/me/academics/abet/index.html

and

www.nre.gatech.edu/me/academics/abet/index.html

In addition, in 2004 the program is undergoing accreditation review by the Southern Association of Colleges and Schools (SACS).

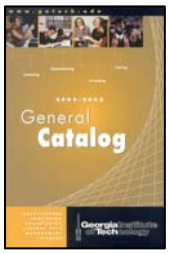
The Undergraduate Handbook

This handbook outlines the procedures that will help you earn a bachelor's degree from Georgia Tech. It can be found in its entirety at

www.me.gatech.edu/me/publicat/handbook/2004

A careful and complete reading of this document is advised. The handbook will be updated yearly, typically before the start of the fall semester. However, any major changes or additions made prior to that time will be posted to our web page (www.me.gatech.edu) with dispatch and an e-mail alert will be sent to all students affected by the change. If you have a question that this handbook does not address, please tell the Office of Student Services. Send suggestions and corrections on this handbook to david.sanborn@me.gatech.edu.

The Georgia Tech General Catalog



Paper copies of the 2003-2005 Georgia Tech General Catalog are available from the Office of Student Services in the MRDC Building, Room 3112, or online at

www.catalog.gatech.edu

Pay particular attention to the general rules and regulations that govern all undergraduate students at Georgia Tech, particularly the section titled **Information for Undergraduate Students**, which is found at

www.catalog.gatech.edu/non-academic/undergrads

Updates to the Georgia Tech catalog, including changes, additions, and deletions that have gone into effect since the publication of the 2003-2005 catalog may be found at

www.catalog.gatech.edu/updates

If you have a question that the General Catalog does not resolve, please contact the Office of Student Services.

OSCAR

For the listing of all classes to be offered each 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.

https://oscar.gatech.edu

The online OSCAR also has instructions, class schedules, and calendar information.

Sources of Information

In addition to the *General Catalog* and the Georgia Tech Web Access System (OSCAR), there 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 Office of Student Services or view

www.me.gatech.edu.

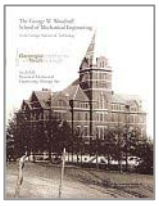
as another source of these materials.

Brochures

The Bachelor's Degree Program in Mechanical Engineering
(This brochure is being revised.)

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
(This brochure is being revised.)


GEORGIA TECH'S
B. S. DEGREE IN NUCLEAR AND RADIOLOGICAL ENGINEERING
AND
THE ACADEMIC COMMON MARKET (BSNRE/ACM)

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

Web Sites

The Woodruff School's Home Page: www.me.gatech.edu

The Woodruff School's home page allows you to 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

www.me.gatech.edu/me/academics

should be a first stop as you navigate through the Woodruff School on the Internet. A search engine is also available at the site. For additional information about the Nuclear and Radiological Engineering program, go to

www.nre.gatech.edu

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

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, usually when the information requires a timely response. At times, e-mail is used to tell you about a special event or to invite you to attend a social event in the School. You may also send a message to

undergraduate.program@me.gatech.edu
or
undergraduate program@nre.gatech.edu

if you have a general question about something.

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**.

Educational Objectives
The faculty of the Woodruff School strives to continuously improve our undergraduate programs in Mechanical Engineering and Nuclear and Radiological Engineering. The educational objectives reflect the needs, and have been reviewed to include the Advisory Board, the faculty, and our students. Please send any comments regarding these objectives to david.sanborn@me.gatech.edu.

- To prepare students for successful careers and life-long learning;
- To train students thoroughly in methods of analysis, including the mathematical and computational skills appropriate for engineers to use when solving problems;
- To develop the skills pertinent to the design process, including the students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively;
- To teach students to use current experimental and data analysis techniques for engineering application;
- To instill in our students an understanding of their professional and ethical responsibilities

Student 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 Woodruff School 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 at**

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 that apply to academic misconduct. Please refer to

www.deanofstudents.gatech.edu/integrity
or
www.registrar.gatech.edu/rules/index.php

for the complete information on the code of student conduct.

THE OFFICE OF STUDENT SERVICES

What is the Office of Student Services?

The purpose of the Office of Student Services 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, and study programs.

Most importantly, please come to the Office of Student Services for any questions you have 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 Office of Student Services may be sent to Dr. David Sanborn, Associate Chair for Undergraduate Studies, at david.sanborn@me.gatech.edu or Dr. Wayne Whiteman, Director of the Office of Student Services, at wayne.whiteman@me.gatech.edu.

Hours and Location

The Office of Student Services, which is sometimes referred to as the Academic Office, is located in Room 3112 in the MRDC Building. 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, we make every attempt to give students 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
MRDC Building, Room 3103

- Oversight of the undergraduate program in the Woodruff School,
- Transfer credit and technical issues,
- Career counseling and advice,
- *Ex officio* member of the School's Undergraduate Committee,
- Liaison for the undergraduate program with other academic units on the Georgia Tech campus.

Dr. Christopher Lynch, Associate Chair for Administration
MRDC Building, Room 3218

- Responsible for the scheduling of classes, overloads, and registration.

Dr. Farzad Rahnema, Associate Chair of the Woodruff School and Chair of the Nuclear and Radiological Engineering/Medical Physics Program
Neely Building, Room G104

- Administers the NRE/MP program in the Woodruff School.

Dr. Wayne Whiteman, Director of the Office of Student Services
MRDC Building, Room 3102

- Manages the Office of the Academic Student Services,
- Assists the Associate Chairs of the Woodruff School,
- Assists in the advisement of both undergraduate and graduate students.

Ms. Kristi Lewis, Undergraduate Academic Advisor
MRDC Building, Room 3108

- Advises all undergraduate, prospective, and newly admitted students,
- Talks with students about scheduling and planning a program of study, setting academic goals, and other concerns regarding the academic programs 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.

Ms. Norma Frank, Academic Advisor I
MRDC Building, Room 3112

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

Ms. Terri Keita, Academic Assistant II
MRDC Building, Room 3112

- Greets and assists students, faculty, staff and visitors to the Office of Student Services,
- Provides general office information to students, faculty, staff, and visitors,
- Answers telephone queries and schedules appointments.

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. To see the Undergraduate Academic Advisor, come to the Office of Student Services to schedule an appointment or to have a walk-in meeting. Otherwise, call (404) 894-3203 (Office) or (404) 894-3205 (Kristi Lewis) to schedule an appointment, or send an e-mail request to glenda.johnson@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.

In addition to the advising services in the Office of Student Services, each undergraduate in nuclear and radiological engineering will also be assigned a faculty advisor/mentor upon entry into the major. The faculty advisor will provide advice about upper-level NRE classes, out-of-class learning, and graduate school and employment information. The chair of the program will send each NRE major a letter that gives the name of the assigned faculty advisor.

THE UNDERGRADUATE PROGRAMS

Degrees

The Woodruff School offers two undergraduate degrees: A bachelor's of science degree in mechanical engineering (B.S.M.E.) and one in nuclear and radiological engineering (B.S.N.R.E.). **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 (Educational Outcomes)

The Woodruff School educates students who will become the leaders in industry, government, 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 identify and formulate engineering problems and apply knowledge of mathematics, science and engineering to solve those problems;
- A familiarity with statistics and linear algebra, a knowledge of chemistry and calculus-based physics with depth in at least one, and the ability to apply advanced mathematics through multivariate calculus and differential equations;
- 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 professionally and with ethical responsibility as an individual and on multidisciplinary teams;
- An ability to communicate effectively;
- A knowledge of contemporary issues and 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 lifelong learning;
- An ability to use the techniques, skills, and modern engineering tools, to include computational tools, necessary for engineering practice;
- An ability to work professionally in both thermal and mechanical systems areas, including the design and realization of such systems (for ME graduates only);
- An ability to apply atomic and nuclear physics, and the transport and interaction of radiation with matter, to nuclear and radiological systems and processes; and an ability to perform nuclear engineering design, to measure nuclear and radiation processes, and to work professionally in one or more of the nuclear or radiological fields of specialization (for NRE graduates only).

Requirements

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 (404-894-7327).

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. For further information, view

www.gsu.edu/webfs01/reg/wwwrtp/public_html/passing.htm

Registration
For questions about registration, go to

www.registrar.gatech.edu
or
https://oscar.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 need to contact the Registrar's Office at

comments@registrar.gatech.edu

or go to Room 103, Registrar's Office in the Administration Building, to remove the level restriction, then, you may register.

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, go to the Office of Student Services.

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

www.registrar.gatech.edu

Bring the completed form to the Office of Student Services to obtain a signature.

Course Meeting Places

Times and meeting places of classes are listed at

https://oscar.gatech.edu
or
www.registrar.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

www.me.gatech.edu/me/curriculum/PlanOfStudy.htm
or
www.me.gatech.edu/me/curriculum/NREPlanOfStudy.htm

Prerequisites and Corequisites

The prerequisites and corequisites for each course in ME and NRE are shown after the curriculum charts. Also, prerequisites for each course can be found in the course syllabi accessible from our home page at

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.

Overloads of Closed Sections and Prerequisite Waivers

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 overload permits and prerequisite waivers, go to

www.me.gatech.edu/overload

to obtain and fill out an Overload Request Form.

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. **Technical electives cannot be taken for pass/fail grades**. These courses have to be taken for a letter grade. Consult with an academic advisor 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 Office of Student Services. 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 Office of Student Services. Listed below are the technical elective course options for ME and NRE.

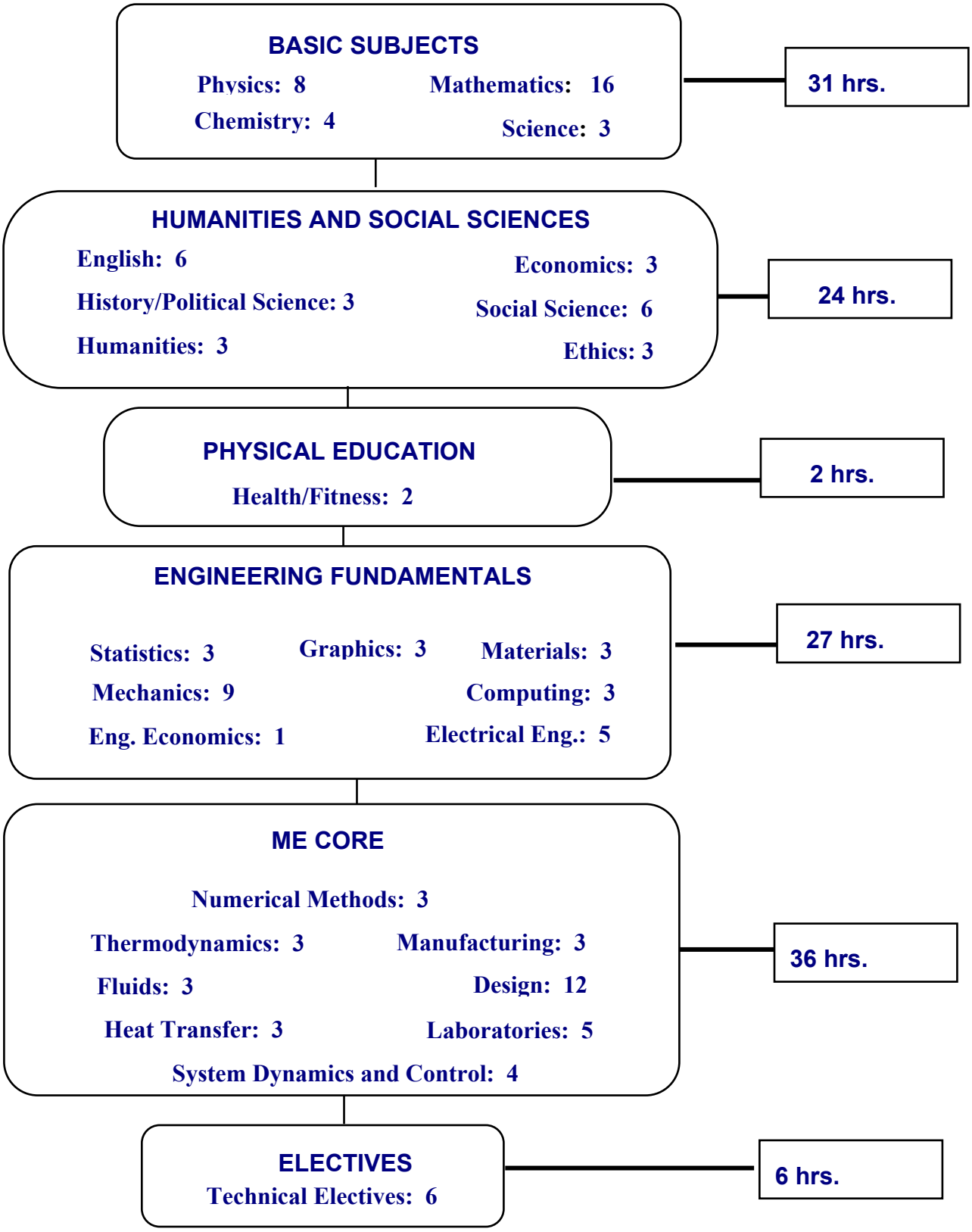
Mechanical Engineering Technical Elective Options

ME 4041	Interactive Computer Graphics and Computer-Aided Design
ME 4113	Kinematics and Dynamics of Linkages
ME 4171	Environmentally Conscious Design and Manufacturing
ME 4172	Designing Sustainable Engineering Systems
ME 4189	Structural Vibrations
ME 4193	Tribological Design
ME 4211	Manufacturing Engineering and Process Applications
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 Systems
ME 4451	Robotics
ME 4699	Research Special Problems, Mechanical Engineering
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 and 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 4794X	Composite Materials and Manufacturing
ME 480X	Special Topics, Mechanical Engineering
ME 481X	Special Topics, Mechanical Engineering
ME 482X	Special Topics, Mechanical Engineering
ME 483X	Special Topics, Mechanical Engineering
ME 4903	Non-Research Special Problems, Mechanical Engineering

Nuclear and Radiological Engineering Technical Elective Options

NRE 4234	Nuclear Criticality Safety Engineering
NRE 4266	Light Water Reactor Technology
NRE 4404	Radiological Assessment and Waste Management
NRE 4430	Nuclear Regulatory Requirements
NRE 4610	Introduction to Plasma Physics and Fusion Engineering
NRE 4699	Research Special Problems, Nuclear and Radiological Engineering
NRE/MP 4750	Radiation Imaging
NRE 4770	Nuclear Chemical Engineering
NRE 480X	Special Topics in Nuclear and Radiological Engineering
NRE 4903	Non-Research Special Problems, 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 (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 1371)[2]		3-0-3
Intro to Eng. Graphs. & Vis. (ME/CE 1770)		2-3-3
Wellness[3]	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 [4]		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[5]	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 [6] (Social Science or Humanities)		3-0-3
Manufacturing Processes & Eng. (ME 4210)	3-0-3	
Technical Elective [7]		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] CS 1321 or COE 1361 were accepted through spring 2004.

[3] 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

[4] 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

[5] Choose only one 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

You cannot get credit for both ECON 2100 and ECON 2105 or ECON 2106

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

HTS 2084	Technology and Society (Social Science)	3-0-3
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

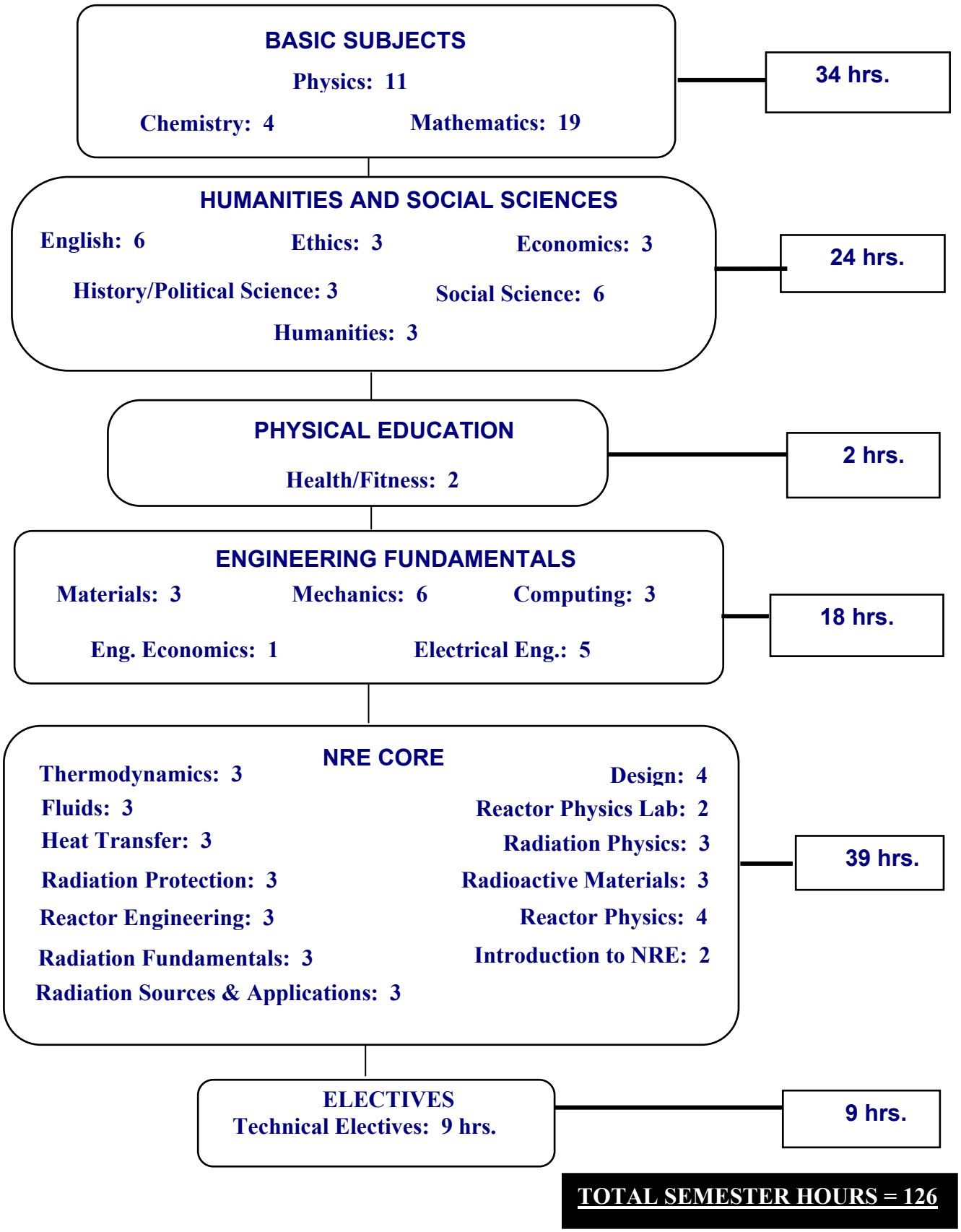
[7] Technical Electives may be selected from any course offered in the Colleges of Engineering, Science, or Computing at the 3000 or 4000 level that does not substantially overlap an undergraduate course which you intend to include in your degree petition. Thus, you cannot take electives which overlap 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. These courses must be taken for a letter grade.

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	None	
ME 1770	None	Math 1501
ME 2016	MATH 1502, CS 1371	
ME 2110	ME/AE/CE 1770	ME 2211, ME 2016
ME 2202	ME 2211, ME 2016	
ME 2211	PHYS 2211	MATH 2401
ME 3015	MATH 2403, ME 2202	ECE 3741
ME 3056	ME 3201, 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	ME 2202	ME 3322
ME 3345	ME 3340	
ME 3720	PHYS 2211, MATH 2403, CHEM 1310	
ME 4041	ME 3180, 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 2110, ME 3180, ME 4315, ME 4210	
ME 4189	ME 3015	
ME 4193	ME 3201, ME 3340	
ME 4210	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 3345	
ME 4321	ME 3345	
ME 4324	ISYE 3025, ME 3345	
ME 4330	ME 3345	
ME 4340	ME 3345	
ME 4342	ME 3345	
ME 4447	ME 3056	
ME 4451	ME 3015	
ME 4754	ECE 3040, ECE 3710	
ME 4757	ME 3340	
ME 4758	ME 3201	
ME 4760	MATH 2403	
ME 4775	CHEM 2312, CHEM 3411	
ME 4763	Senior Standing	
ME 4764	Senior Standing	
ME 4776	CHE/CHEM/ME/MSE/PTFE 4775	
ME 4777	MSE 2001, CHEM 2311	
ME 4781	ECE 3050 or ECE 3710	
ME 4782	MATH 1502	
ME 4791	ME 3201	
ME 4793	CHEM 1310, 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 (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 1371)[2]		2-3-3
Intro to NRE 2110		2-0-2
Wellness[3]	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[4]	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[5]	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 [6]	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] CS 1321 or COE 1361 were accepted through spring 2004.

[3] 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

[4] Choose from only one:

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

You cannot get credit for both ECON 2100 and ECON 2105 or ECON 2106.

[5] 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. These courses must be taken for a letter grade.

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

HTS 2084	Technology and Society (Social Science)	3-0-3
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.

Course	Prerequisites	Corequisites
NRE 2110	None	
NRE 3112	NRE 2210, NRE 3301	
NRE 3212	MATH 2401, MATH 2403, PHYS 2213	
NRE 3301	PHYS 2213	
NRE 3316	NRE 3301, MATH 2403 or MATH 2413 or MATH 24X3	Phys 3001
NRE 4204	NRE 3301, MATH 4581 or ISyE/MATH 3770	Math 4581
NRE 4206	NRE 3212, NRE 4204	
NRE 4214	ME 3340, ME 3345	
NRE 4232	NRE 4328, NRE 4204	
NRE 4234	NRE 4204	
NRE 4266	NRE 4204, NRE 4214	
NRE 4328	NRE 3301, NRE 3112, OR NRE 3212	
NRE 4404	NRE 3316	
NRE 4430	NRE 3316	
NRE 4610	Senior standing in science or engineering	
NRE 4750	NRE 3312, NRE 4204	
NRE 4801-2-3	Consent of the School	
NRE 4903	Consent of the School	

COURSES

All courses in Mechanical Engineering and Nuclear and Radiological Engineering are described in the *Georgia Tech General Catalog* at.

www.catalog.gatech.edu/programs/coe/mechanical.php#memajor
and
www.catalog.gatech.edu/programs/coe/mechanical.php#nremajor

In addition, go to

www.me.gatech.edu/me/academics

to view the courses and syllabi.

Note: All required courses must be taken for a letter grade.

Required Courses in Mechanical Engineering

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

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 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.

Undergraduate Research/Special Problems Courses

Several options are available for a Special Problems Course as shown in the accompanying chart. ME/NRE 4903 is a non-research special problem. ME 4903 is usually a design course and may be combined with ME 4182 to work on a two-semester design problem. ME/NRE 4699 and ME/NRE 2699 are research special problems courses. ME/NRE 4699 is for juniors and seniors and will qualify as a technical elective. ME/NRE 4698 and ME/NRE 2698 are research internships. You will be paid for working on a project and the work will be entered on your transcript.

In all cases, you must find a faculty member to work with. Dr. Sanborn simply administers the courses. He will determine which faculty are interested in sponsoring a course and will notify interested students. However, the most effective method of finding a willing faculty member is to approach those who work in a field that interests you and let them know that you are interested. All courses are nominally three credit hours and enrollment requires a permit. Once you have found an interested faculty sponsor, obtain the appropriate form from the Office of Student Services, select a title for the project, write a paragraph describing both the work to be performed and the required deliverable at the end of the term, obtain the required signatures and return it to Dr. Sanborn. He will sign the form and issue a registration permit.

Each special problem must culminate in a written final report, which is to be submitted to the faculty advisor for grading and forwarded to the Office of Student Services 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 taken for credit are given a letter grade.

Undergraduate Research Courses								
Course Number	Standard Credit Hours [1]	Hours Count for Degree per Institute?	Hours Count for Degree per ME?	Used As	For Pay?	Grading	New Description	Eligible
ME 4903 NRE 4903	3	Yes	Yes	Technical Elective	No	A - F	Non-Research Special Problem [4]	Juniors, Seniors
ME 4699 NRE 4699	3	Yes	Yes	Technical Elective	No	A - F	Research Special Problem [4]	Juniors, Seniors
ME 2699 NRE 2699	3	Yes	No [3]	Free Elective	No	A - F	Research Special Problem [4]	Freshmen, Sophomores
ME 4698 NRE 4698	3	No	No	Transcript Entry Only	Yes	P/F	Undergraduate Research – Pay [5]	Juniors, Seniors
ME 2698 NRE 2698	3	No	No	Transcript Entry Only	Yes	P/F	Undergraduate Research – Pay [5]	Freshmen, Sophomores

Notes:
1. The new courses are not strictly limited to 3 credit hours.
2. Three credit hours would typically require 9 research hours work per week (14 during the summer term)
3. ME currently does not have a free elective.
4. Requires a written statement of work and deliverables. Must be signed by student and advisor to obtain a registration permit.
5. Requires completion of a form detailing hours to be worked and pay rate. Must be signed by student and advisor to obtain a registration permit.

For more information on undergraduate research, see

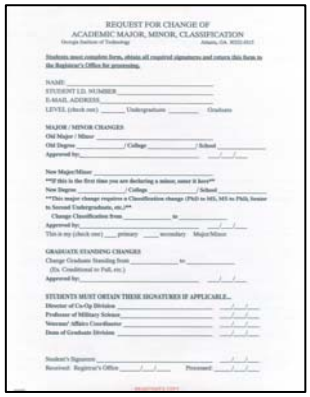
www.undergradresearch.gatech.edu/undergradresearch.htm
or
www.me.gatech.edu/me/academics.

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. Go to the Woodruff School's Office of Student Services 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 may be Humanities courses. An additional semester of absence from campus may be required to allow time for evaluation of your qualifications for readmission. The summer term qualifies as a semester off. This evaluation will include an academic review with the Undergraduate 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 three semesters. Each term, students must enroll in the courses specified in the contract. Courses may not be dropped. If a course cannot be scheduled, an amended contract must be signed and approved.

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 and 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 (I) 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.** Incompletes are only given for nonacademic reasons.

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.

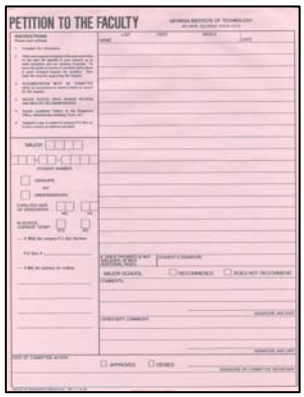
Pass/Fail

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** is available in the Office of Student Services. Complete the form, obtain the recommendation and signature of the Undergraduate Academic Advisor 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 the academic advisor before you begin the readmission 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.

Repeating Courses

Courses that are passed with a grade of C or better normally may **not** be repeated. Consult with Dr. Sanborn or the academic advisor if you are considering retaking a non-math course in which you received a grade of D. 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. Except for math, a grade of D or better is considered passing.

Ten-Year Rule

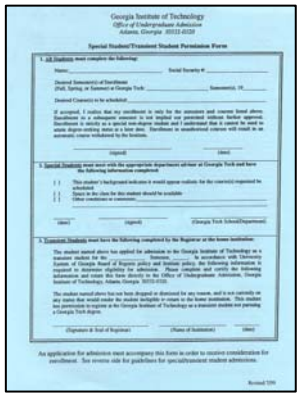
Courses completed more than ten years prior to your graduation must be validated by a special examination.

Thirty-Six-Hour Rule

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

Transfer Credit

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.


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

Special Student/Transient Student Permission Form

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

www.registrar.gatech.edu/students/transfercredit.php

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 Office of Student Services. 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 the Office of Student Services. You will be notified of the outcome of your request by an e-mail from Dr. David Sanborn, Associate Chair for Undergraduate Studies.


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!!

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.

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 Georgia 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 a 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 the Undergraduate Academic Advisor to discuss your application for readmission. A positive recommendation normally will 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 will **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 the Undergraduate Academic Advisor in the Office of Student Services.

Withdrawal From a Course

You may withdraw from a course on-line without penalty any time before fifty percent of the term has been completed, as specified by the official calendar. The exact date of the last day that withdrawals can be accepted is published online at

www.registrar.gatech.edu/home/calendar/2004/fiveterm.php

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 the Undergraduate Academic Advisor. 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 the Undergraduate Academic Advisor 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 Office of Student Services. This petition must be completed the semester preceding the semester of your graduation and be at the Registrar's Office by the published due date. The Office of Student Services will inform you of the due date by e-mail. **You are strongly encouraged to turn in degree petitions early, so that the petition can be reviewed by the Office of Student Services 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

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

RESPONSIBILITY OF STUDENT

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 Office of Student Services 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.

B.S.M.E. Degree Petition Checklist for 2004 – 2005

B.S.N.R.E. Degree Petition Checklist for 2004 – 2005

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 2004 – 2005

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 1371 _____

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 _____
Humanities Elective _____
Humanities Elective _____

Which course satisfied the Ethics requirement?**
_____

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

Total Hours
Hours earned at Georgia Tech _____
Nonresident credits _____
Current and last semester's credits _____
Total _____
Minus extra hours _____
Net credits (126)

*See the Georgia Tech Catalog at **www.catalog.gatech.edu** for allowable humanities and social science electives.
** Choose one Ethics course from: HTS 2084 (Social Science), INTA 2030 (Social Science), PST 3105 (Humanities), PST 3109 (Humanities), PST 3127 (Humanities), or PST 4176 (Humanities).

B.S.N.R.E. Degree Petition Checklist for 2004 – 2005

Designated Courses (91 hours)

Chem 1310 _____

Math 1501 _____
Math 1502 _____
Math 2401 _____
Math 2403 _____
Math 4581 or _____
MATH/ISyE 3770_____
MSE 2001 _____

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

PHYS 2211 _____
PHYS 2212 _____
PHYS 2213 _____

ECE 3301 _____
ECE 3710 _____
ECE 3741 _____
CS 1371_____
ISYE 3025_____

NRE 2110_____
NRE 3112_____
NRE 3212_____
NRE 3301_____
NRE 3316_____
NRE 4204_____
NRE 4206_____
NRE 4214_____
NRE 4232_____
NRE 4328_____

Elective Courses (35 Hours)

Humanities* (12 hours)
ENGL 1101_____
ENGL 1102_____
Humanities Elective_____
Humanities Elective_____

Which course satisfied the Ethics requirement?**
_____

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_____

Total Hours

Hours earned at Georgia Tech	_____
Nonresident credits	_____
Current and last semester's credits	_____
Total	_____
Minus extra hours	_____

Net credits (126)

*See the Georgia Tech Catalog at **www.catalog.gatech.edu** for allowable humanities and social science electives.
** Choose one Ethics course from: HTS 2084 (Social Science), INTA 2030 (Social Science), PST 3105 (Humanities), PST 3109 (Humanities), PST 3127 (Humanities), or PST 4176 (Humanities).

CAREERS

A major in mechanical engineering will give you many 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 hundreds of company visits to campus each academic year, with most employers looking to hire mechanical engineers.

For information on student and employer services, view

www.career.gatech.edu

Those Woodruff School students who go to graduate school get accepted at many top-ten schools. Almost twenty percent of our graduating seniors go directly to graduate or professional school, and the remaining eighty 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.

www.counseling.gatech.edu/services.htm

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 at (404) 894-2575.

FINANCIAL AID

Scholarships

Many awards recognize academic achievement and outstanding service to the School, the College, and the Institute.

HOPE Scholarships

Many students at Georgia Tech hold HOPE Scholarships, a program funded from Georgia State Lottery proceeds. Approximately fifty percent of the in-state mechanical engineering students in the Woodruff School have this aid.

President's Scholarships

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 a.m. - 4:30 p.m.

www.finaid.gatech.edu/hope/

Woodruff School Scholarships and Awards

The Woodruff School has a number of designated scholarships and awards for mechanical engineering students who excel in scholarship, leadership, and service to the School. 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 Office of Student Services.** These résumés should be updated periodically and reviewed with the Undergraduate Academic Advisor. In addition to the résumé, the Undergraduate Academic Advisor may also request an interview with scholarship candidates.

Awards are announced at Student Honors Day held in the spring semester. The winners are chosen by the Associate Chair for Undergraduate Studies and the Undergraduate Academic Advisor with approval by the School Chair. These awards, which often include a monetary award, are:

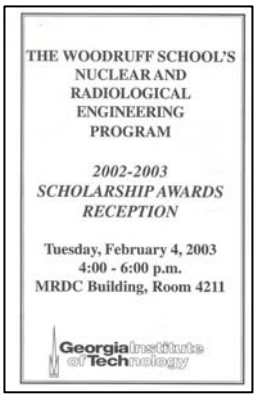
- Pi Tau Sigma Outstanding Junior Award for demonstrating outstanding scholarship and service to the School and student activities.
- Pi Tau Sigma Outstanding Senior Award for outstanding scholarship achievement and service to the School, the Institute, and to student activities.
- Pi Tau Sigma Outstanding Sophomore Award given for demonstrating outstanding scholarship service to the School and to student activities.
- Richard K. Whitehead Jr. Memorial Award, which is given to an outstanding mechanical engineering senior who exemplifies high standards of scholarship and service.

- Samuel P. Eschenbach (class of 1933) Memorial Award in Mechanical Engineering is based on academic performance, leadership capabilities in the campus community, and promise as a mechanical engineer.
- Woodruff School Chair's Award is given for outstanding scholarship and contributions to the School, especially to its program by a graduating senior.
- Woodruff School Outstanding Scholar Award which recognizes a graduating senior who has achieved an exceptional scholastic record in the mechanical engineering program.

Awards in the College of Engineering and the Institute
Woodruff School students may also qualify for awards at the Institute or College of Engineering level. These are announced on Student Honors Day toward the end of the spring semester. These include:

- Georgia Engineering Foundation Senior Design Award, which is presented to the design team producing the most outstanding senior design project in the College of Engineering.
- Georgia Tech Alumni Association Student Leadership Award for International Study which recognizes outstanding student leaders and provides them with the opportunity to broaden their educational experience through travel abroad. They must also have demonstrated significant potential for future alumni leadership.
- James G. and Mary G. Wohlford Scholarship recognizes outstanding senior coops who have excelled academically and on their coop jobs and who have made contributions to the community.
- Robert Engineering Award presented on an annual rotation to an outstanding rising senior in CE, ECE, ISyE, and ME.

Nuclear and Radiological 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.


THE WOODRUFF SCHOOL'S
NUCLEAR AND
RADIOLOGICAL
ENGINEERING
PROGRAM

2002-2003
SCHOLARSHIP AWARDS
RECEPTION

Tuesday, February 4, 2003
4:00 - 6:00 p.m.
MRDC Building, Room 4211

Georgia Institute of Technology

Academic Common Market (ACM)
The ACM provides an exciting opportunity for students from the southeast whose state universities do not offer a B.S.N.R.E. 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

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

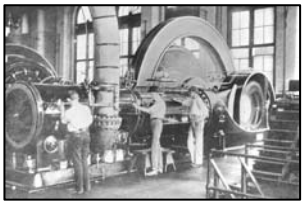
Other Financial Aid Sources
If you need to take out a loan, U. S. (Stafford) and State Government loans are available to American citizens and permanent residents only; they require advance planning. Contact the

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 the Office of Student Services at (404) 894-3203. It is important to check periodically with the Office of Student Services 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

www.coop.gatech.edu

The International Cooperative Program

By completing work assignments in a foreign county and exhibiting proficiency in a foreign language, you may earn the "International Cooperative Plan" designation on your degree. Information for Students Working Abroad. This is a great opportunity to utilize your foreign language skills, gain a global perspective and experience a diverse culture. About a half dozen ME students are living in Germany and working at Siemens (in Munich).

If you are a co-op/intern student who would like to experience working overseas in a foreign country, please schedule an appointment with Ken Little to discuss opportunities and requirements for participating in the International Co-op Degree Program OR Undergraduate Professional Internship. For more information on this program, please view

www.profpractice.gatech.edu

The Undergraduate Professional Internship Program

In fall 2002, the Undergraduate Professional Internships (UPI) Program was established at Georgia Tech. The first students participated in the program in spring semester 2003. This program is geared toward those students who could not or did not participate in the cooperative program, but want some career-related experience before graduation. The program is open to all majors at Georgia Tech, and is aimed mainly at rising juniors and seniors.

Program Requirements

Requirements for the program include: completion of 30 hours of academic coursework at Georgia Tech; transfer students must complete one semester of full-time study at Georgia Tech; a minimum

2.0 GPA and good academic standing; a completed application to the UPI program; and completion of a full course load during the term immediately proceeding the work assignment.
For more information and application instructions, view

www.profpractice.gatech.edu/students/upi.html

or call (404) 894-3320 if you have any questions about the program.

Since the inception of the program mechanical engineering students have participated: 2 in summer 2003, 4 in spring 2004, and 22 in summer 2004. Students generally work for one semester, typically in the summer, with an option for more. Students are typically late sophomores, juniors, or seniors. Companies in which mechanical engineering students have worked are: Applied Materials, Cummins, Department of the Air Force, Eli Lily & Company, GE, Robert Bosch Corp., Texas Instruments, and Siemens.

Other Learning Opportunities in NRE

Undergraduate research with NRE faculty mentors typically begins in the junior year. NRE suggests that students begin with undergraduate research for course credit by finding a faculty research mentor and signing up for NRE 4901, Special Problems in NRE. The following semester the successful student should apply to the President's Undergraduate Research Awards

www.undergradresearch.gatech.edu

(up to $1,500 for student salary, up to $1,000 for student travel to professional meetings) or NRE's new Undergraduate Research Scholar's Program (up to $1,000 for student salary). The NRE program requires a GPA of 3.3 or higher to apply. Applications for the NRE program are available from Dr. Nolan Hertel. Other opportunities for paid undergraduate research opportunities can be found at

www.undergradresearch.gatech.edu/institute-wide.htm

Successful seniors that plan to continue research can apply to the faculty research mentor for continued salary support.

Nuclear and Radiological Engineering (NRE) encourages undergraduates to pursue out-of-class experiences to further their professional development. The department has arranged for hands-on experience in nuclear and radiological engineering to be acquired through a coop assignment, internship, or undergraduate research experience. The Office of Professional Practice offers long-term, alternating full-time work experience for NRE majors through their coop program

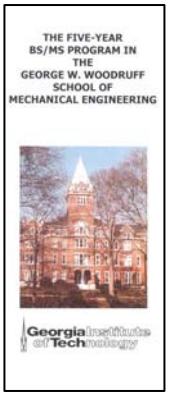
www.coop.gatech.edu

and short, one semester professional work experience through their Professional Internship Program.

The Five-Year BS/MS Program

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 an M.S. in Mechanical Engineering, or a B.S. in Nuclear and Radiological

Engineering and an M.S. in Mechanical Engineering, or a B.S. in Mechanical Engineering and an M.S. in Nuclear and Radiological Engineering. To learn if you are eligible for this individualized program, view



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

Program Requirements

To be eligible for the program you should have completed 30 semester credit hours at Georgia Tech, which is typically at the end of your freshman year; shown appropriate progress in your degree program; and obtained a grade point average of 3.5 or higher. You must apply to the program before you complete 75 semester credit hours, including transfer and advanced placement credits.

You will need to submit a one-page application form and a short biographical statement. There is no need to take the Graduate Record Exam (GRE) for admission to the program.

The United Technologies Teaching Intern Program

This program is funded by the United Technologies Corporation and supports up to seven junior and senior mechanical engineering students for one or 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 Study Program. For more information, contact Dr. David Sanborn at david.sanborn@me.gatech.edu.

Studying Abroad

Woodruff School students participate in a number of study-abroad programs. These programs usually offer courses taught by Georgia Tech faculty. In 1997, the Institute began managing reciprocal exchange programs that allow students to attend foreign universities for a portion of their academic program. During the past academic year, Woodruff School students participated in these programs: Aerospace Engineering in Russia (3 students), Brussels Summer Program (2 students), Costa Rica Summer Program (1 student), Exchange Programs (3 students), German Language for Business and Technology (2 students), Georgia Tech Lorraine Summer Program for Undergraduates (25 students), Oxford Summer Program (8 students), Pacific Study Abroad Program (8 students), Spanish Language for Business and Technology (2 students), Technical University Munich/Siemens (1 student), and Work Abroad/International Coop (1 student).

For more information about these opportunities, contact International Student Programs at (404) 894-7475. See also

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

The 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 B.S.M.E. or B.S.N.R.E. program. During the registration period for the first semester of residence at Georgia Tech, you should meet with the Undergraduate Academic Advisor 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 B.S.M.E. or B.S.N.R.E. 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.

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.

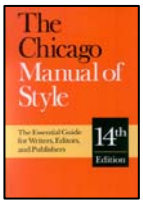
www.me.gatech.edu/me/academics/little_red_schoolhouse

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.

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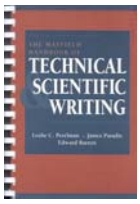
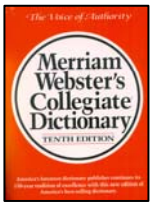


Dictionaries



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

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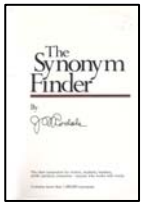


Grammar

Hodges' Harbrace Handbook, Fifteenth Edition, J. C. Hodges et al. Heinle Publishing Co., 2003.

The Little, Brown Handbook, Ninth Edition, H. R. Fowler et al. Longman Publishers, 2003.

Study Programs

Academic Study Program in the Woodruff School
The Academic Study 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 Office of Student Services (MRDC, Room 3112) 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.

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, go to

www.omed.gatech.edu/blueprint/index.htm

or call (404) 894-3959.

One-to-One Tutoring, Success Programs

This is a tutoring service in the core mathematics, computer science, physics, and chemistry course offered by the Office of Success Programs. Go to Room 105 in the ESM Building during the day. For an appointment, go to

www.successprograms.gatech.edu/tutoring/policy.html

or call (404) 894-1945.

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.

Certificate Program and Minor in Nuclear and Radiological Engineering

The Nuclear and Radiological Engineering/Medical Physics Program in the Woodruff School offers a certificate and a minor in Nuclear and Radiological Engineering to non-NRE engineering students. The requirements for both programs include the following courses:

NRE 3301	Radiation Physics (3-0-3)
NRE 3212	Fundamentals of Nuclear Engineering 3 (3-0-3)
NRE 3316	Radiation Protection Engineering 3 (3-0-3)

Additional courses are required from the list below for a total of at least 12 credit hours for the Certificate Program and 18 credit hours for the Minor Program.

NRE 2110	Introduction to Nuclear and Radiological Engineering 2 (2-0-2)
NRE 4204	Nuclear Reactor Physics 4 (4-0-4)
NRE 4206	Radiation Physics Laboratory 2 (1-3-2)
NRE 4214	Reactor Engineering 3 (3-0-3)
NRE 4232	Nuclear Radiological Engineering Design 4 (1-9-4)
NRE 4234	Nuclear Criticality Safety Engineering 3 (2-3-3)
NRE 4266	Light Water Reactor Technology 3 (3-0-3)
NRE 4328	Radiation Sources and Applications 3 (3-0-3)
NRE/MP 4775	Radiation Imaging 3 (3-0-3)
NRE 4404	Radiological Assessment and Waste Management 3 (3-0-3)
NRE 4610	Introduction to Plasma Physics and Fusion Engineering 3 (3-0-3)
NRE 4770	Nuclear Chemical Engineering 3 (3-0-3) (Crosslisted with ChE 4770

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. You are encouraged to take this exam in your senior year. Check Woodruff School bulletin boards and e-mail messages for information and instructions on this test. 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 application, available online some time before the exam at

www.ncees.org

must contain a recent picture of the applicant, be typed, notarized (Norma Frank is a Notary Public), and signed by five references, three of whom must be registered Professional Engineers. The three P. E. signatures will be obtained for you by the Woodruff School.

The Application

The application consists of two parts. The first part is sent to the Georgia Secretary of State's Office and costs $20. The first part of the application should be turned in to Norma Frank in the Office of Student Services. The second portion of the exam can be completed online at

www.ncees.org

To get the application, follow these directions: Choose **Exam Registration** in the left-hand column under Exams. Choose **Georgia** in the jurisdiction column. Choose **Online Registration** in the rightmost column under Related Pages. Choose **Proceed to Registration**. Choose **Buy online** under Georgia Tech (The FE Exam Registration fee has been $95.00). Choose **Add to cart**.

Application deadlines are approximately the first week in January for the April test and the last week in June for the October exam.

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 Office, the Finance Office, and the Office of Student Services, many undergraduate laboratories, and some classrooms.

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

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 account and password, usually referred to as a GT account (until recently, this was called 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 activate your user account and password in Room 140 of the Rich Building.

Computer Clusters

The Woodruff School maintains three 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 20-inch flat panel monitors, two HP LaserJet 8150 32 ppm, 11 x 17 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. Log on information is posted. 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 2210, (404) 894-6824, or send an e-mail to michael.murphy@me.gatech.edu.

The **Computer Aided Engineering (CAE) Laboratory** (MRDC, Room 2105) houses 27 higher end PC compatible multimedia computers, CD-Writers, and 20 inch flat panel monitors, a Lexmark 11x17 24ppm laser printer, an HP 4550 color laser printer, an HP 4600 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

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

The **Nuclear and Radiological Engineering Computer Cluster** (NNRC/G114) houses PC-compatible computers and printers. Some of the computers in this cluster are available for general use by NRE students. The rest of the computers are reserved for NRE classes requiring nuclear engineering specific codes. Instructions for use of the facility are posted on the door.

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

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 2103.

Woodruff School Cyber Station

E-mail and web access are available at the Woodruff School Cyber Station, located on the 2nd floor of MRDC. The workstation may be used by Woodruff School students and guests of the School, and accesses Internet-based e-mail, general web browsing, and secure telnet messages. While you can use the Cyber Station as often as you like, it is intended for short-term use. Please be award of others who are waiting to use the terminal and limit your activity accordingly. For complete instructions, view

www2.me.gatech.edu/kioskhome.htm

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


MACHINE SHOP
STUDENT WORK REQUEST

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


FABRICATION SHOP
STUDENT WORK REQUEST

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

www.me.gatech.edu/support/electronics

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): www.me.gatech.edu/sac

Joining the Woodruff School Student Advisory Committee is the best way to become part of the decision-making process in the Woodruff School. WSSAC 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. Dr. David Sanborn is the advisor.

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.

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

American Nuclear Society (ANS): http://cyberbuzz.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 Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE): 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.

American Society of Mechanical Engineers (ASME): 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. Jeffrey Streator is the faculty advisor.

SAE International: www.me.gatech.edu/sae

SAE International 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.

Society of Manufacturing Engineers (SME): cyberbuzz.gatech.edu/sme

The Society of Manufacturing Engineers is an international professional society dedicated to serving its members and the manufacturing community through the advancement of professionalism, knowledge, and learning. Members have access to the resources needed to compete in today's rapidly changing manufacturing environment. The student chapter meets regularly and sponsors plant trips and events such as building a bridge out of toothpicks. Dr. William Singhose is the faculty advisor.

Honor Societies

Pi Tau Sigma: 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. In the fall, the Society sponsors the Mechanical Challenge, a jeopardy-style competition with questions similar to the ones in the GRE and EIT exams. The group also runs the Academic Study Program in the Woodruff School (see the section on Study Programs). Dr. Janet Allen is the faculty advisor.

Gamma Beta Phi: 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: 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.

Student Competition Groups

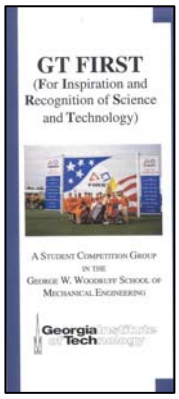
***gt* motorsports www.me.gatech.edu/gtmotorsports**

***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, winning the competition in 2001 and 2003. In December 2003, the team went to Australia and won the overall competition. Dr. Ken Cunefare is the faculty advisor.

GT Off-Road (Mini-Baja Team) 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: robojackets.org



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, Vacubots, and the Intelligent Ground Vehicle Competition. The group also works with high schools and community groups as part of the FIRST competition. Robojackets sponsors the Lego Robot Competition, where Georgia high school teams learn about robotics by building remote-controlled robots. Dr. Imme Ebert-Uphoff is the faculty advisor for RoboJackets and Dr. Wayne Book is the FIRST faculty advisor.

FACULTY

The Woodruff School has 81 tenure-track faculty (all with Ph.D.'s), twenty-one research faculty, five academic professionals, and forty-seven staff members. Fourteen 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-three faculty members have received prestigious National Science Foundation Career Awards; at least thirty-nine hold the grade of Fellow in professional societies, such as the ASME or the ANS; and faculty members hold more than 192 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

firstname.lastname@me.gatech.edu
or
firstname.lastname@nre.gatech.edu

for NRE faculty only.

View the individual faculty web pages at

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

Acoustics and Dynamics

Yves H. Berthelot, Professor Acoustics, laser instrumentation in acoustics, ultrasonics	LOVE 124 404-894-7482
Kenneth A. Cunefare, Associate Professor Active/passive control, modeling and control of brake squeal, fluid-structure interaction, and optimal acoustic design	LOVE 113 404-894-4726
Aldo A. Ferri, Associate Professor Acoustics, structural dynamics, nonlinear dynamics and control	LOVE 107 404-894-9032
Jerry H. Ginsberg, George W. Woodruff Chair in Mechanical Systems and Professor of Mechanical Engineering Vibrations, acoustics, dynamics, fluid-structure interaction	LOVE 101 404-894-3265
Peter H. Rogers, Rae and Frank Neely Professor in Mechanical Engineering Underwater acoustics and bioacoustics	LOVE 118 404-894-3235

Automation and Mechatronics

Wayne J. Book, HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control and Professor of Mechanical Engineering Robotics, automation, modeling fluid power, and motion control	LOVE 202 404-894-3247
Ye-Hwa Chen, Professor Controls, manufacturing systems, neural networks, fuzzy engineering	MARC 440 404-894-3210
Imme Ebert-Uphoff, Associate Professor Robotics, theoretical kinematics, dynamics, parallel manipulators, and digital clay	MARC 476 404-385-0667
Kok-Meng Lee, Professor System dynamics, control, automation, optomechatronics	MARC 474 404-894-7402
Harvey Lipkin, Associate Professor Design and analysis of mechanical systems, robotics, and spatial mechanisms	LOVE 214 404-894-7410
John G. Papastavridis, Associate Professor Analytical, structural/nonlinear mechanics, vibrations, and stability	LOVE 132 404-894-2789
Nader Sadegh, Associate Professor Controls, vibrations, and design	MARC 475 404-894-8172
William Singhose, Assistant Professor Vibration, flexible dynamics, and command generation	MARC 432 404-385-0668

Bioengineering

Andrées Garcíía, Associate Professor Cellular and tissue engineering, cell adhesion, and biomaterials	IBB 2314 404-894-9384
Robert Guldberg, ~~Assistant~~ Associate Professor Biomechanics, microCT imaging and tissue engineering	IBB 2311 404-894-6589
Jens O. M. Karlsson, Associate Professor Thermodynamics and transport in biological systems, nonequilibrium solidification, tissue engineering, and bioMEMS	LOVE 005 404-385-4157
David N. Ku, Lawrence P. Huang Endowed Chair in Engineering and ~~Entrepeurship~~Entrepreneurship and Regents' Professor Thrombosis, biomaterials, and tissue engineering	IBB 2307 404-894-6827
Marc Levenston, Associate Professor Orthopedic biomechanics, soft tissue mechanics, tissue engineering	IBB 2312 404-894-4219
Robert M. Nerem, Parker H. Petit Distinguished Chair for ~~Chair~~ Engineering in Medicine and Institute Professor Biomedical engineering, cellular and tissue engineering	IBB 1106/1305 404-894-2768
Raymond P. Vito, Associate Dean for Academic Affairs and Professor Biomechanics, tissue mechanics, and design	IBB 2305 404-894-2792
Timothy Wick, Professor of Chemical Engineering (Joint Appointment)	IBB 1310

Tissue and bioprocess engineering, bioreactor design, cell adhesion, and blood rheology	404-894-8795
Ajit Yoganathan, Regents' Professor (Joint Appointment) Cardiovascular fluid dynamics, rheology, Doppler ultrasound, and MRI	IBB 2303 404-894-2849
Cheng Zhu, Professor Biomechanics of single cells and single molecules, cell adhesion kinetics, and bio-MEMS	IBB 1308 404-894-3269

Computer-Aided Engineering and Design

Bert Bras, Professor Environmentally conscious design, design for recycling, and robust design	MARC 253 404-894-9667
Farrokh Mistree, Professor Strategic design, design of product families and distributed design and manufacture	MARC 262 404-894-8412
Christiaan Paredis, Assistant Professor Simulation-based design, information technology for design, mechatronics, and evolutionary algorithms	MARC 256 404-894-5613
David W. Rosen, Professor Virtual and rapid prototyping, intelligent CAD/CAM/CAE	MARC 252 404-894-9668
Suresh K. Sitaraman, Professor CAD/CAE, electronic packaging, thermomechanics and reliability, and FEM	MARC 471 404-894-3405

Fluid Mechanics

Cyrus Aidun, Professor Hydrodynamic stability, liquid coating, and suspended particle hydrodynamics	IPST 313 404-894-6645
~~**Prateen Desai, Professor** **Fluid mechanics, solidification, convection in materials processing**~~	~~**207 Love** **4-3244**~~
Ari Glezer, George W. Woodruff Chair in Thermal Systems and Professor of Mechanical Engineering Fluid mechanics, turbulent shear flows, flow control, diagnostics	LOVE 239 404-894-3266 ~~4-3266~~
G. Paul Neitzel, Professor Hydrodynamic stability, surface-tension-driven and rotating flows, noncoalescence, and nonwetting and bioreactor fluid dynamics	LOVE 229 404-894-3242
David Parekh, Deputy Director of GTRI and Associate Vice Provost for Research (Joint Appointment) Active flow control, propulsion, and fuel cell systems	GTRI-COBB COUNTY 770-528-7826
Marc K. Smith, Professor	LOVE 237

Hydrodynamic stability, liquid films, droplet atomization 404-894-3826

Fotos Sotiropoulos, Associate Professor of Civil and Environmental Engineering (Joint Appointment) MASON 229 404-894-4432
Computational fluid dynamics, turbulent shear flows, fluid mixing, biofluid mechanics, and environmental hydraulics

Minami Yoda, Associate Professor — LOVE 228
Experimental fluid mechanics, suspension flows, nano- and microfluids, and optimal diagnostics — 404-894-6838

~~**Fusion**~~

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

Heat Transfer, Combustion and Energy Systems

Frederick W. Ahrens, Professor — IPST 321
Heat and mass transfer, drying, transport phenomena in porous media, thermal and energy systems modeling, simulation, and optimization. — 404-894-6496

J. Narl Davidson, Associate Dean of Engineering and Professor — COE 301
Academic administration, engineering education, plasma physics, and power plant operation — 404-894-3350
~~4-3719~~

Andrei Fedorov, Assistant Professor — LOVE 307
Catalysis and fuel cells, chemical and electrochemical sensors, atomic force microscopy, and thermal radiation — 404-385-1356

Srinivas Garimella, Associate Professor — LOVE 340
Sustainable technologies, phase change in microchannel and compact heat exchangers, heat and mass transfer in binary mixtures — 404-894-7479

Mostafa Ghiaasiaan, Professor — LOVE 308
Multiphase flow, aerosol and particle transport, microscale heat transfer, and nuclear reactor thermohydraulics — 404-894-3746

Sheldon M. Jeter, Associate Professor — LOVE 330
Thermodynamics, energy systems, and heat transfer — 404-894-3211

Yogendra K. Joshi, John M. McKenney and Warren D. Shiver Distinguished Chair in Building Mechanical Systems and Associate Chair for Graduate Studies — LOVE 338 — 404-385-2810
Thermo-fluid issues in emerging technologies and microthermal systems

J. Robert Mahan, Academic Affairs Director at Georgia Tech Lorraine and Professor — GT Lorraine
Heat transfer, thermal radiation, applied optics, and infrared Survivability of air targets

David Orloff, Professor — IPST 315
Impulse drying, pressing, and web preheating — 404-894-6649

~~**Alan V. Larson, Professor and Associate Chair of Administration — 3218 MRDC**~~
~~**Thermodynamics — 4-3201**~~

Samuel V. Shelton, Associate Professor — LOVE 216
Energy systems, HVAC systems, absorption, refrigeration — 404-894-3289

William J. Wepfer, Vice Provost for Distance Learning and Professional Education and Professor- — SWANN — 404-894-8920

Heat transfer and thermodynamics

Zhuomin Zhang, Associate Professor — LOVE 343, 4-3759
Microscale heat transfer, thermophysical properties, and radiation thermometry

Ben Zinn, David S. Lewis Jr. Chair in Aerospace Engineering and Regents' Professor (Joint Appointment) — KNIGHT 365G, 404-894-3033
Combustion instability, active control, microscale combustion, propulsion, and acoustics

Manufacturing

Daniel F. Baldwin, Associate Professor — MARC 432, 404-894-4135
Manufacturing systems design, electronics manufacturing and packaging, and polymer processing

Jonathan S. Colton, Professor — MARC 434, 404-894-7407
Manufacturing, polymer/composites processing, rapid prototyping, and nano/microfabrication

Steven Danyluk, ~~Professor,~~ Morris M. Bryan Jr. Chair in Advanced Manufacturing Systems and Professor — MARC 313, 404-894-9687
Semiconductor processing, lubricant-surface interaction, polishing and sensors

Thomas R. Kurfess,~~Professor~~ Professor — MARC 435, 404-894-0301
System dynamics, control, metrology, CAD/CAM/CAE, and precision system design

Steven Y. Liang, Professor — MARC 438, 404-894-8164
Automated manufacturing, controls systems, digital signal processing

Shreyes N. Melkote, Associate Professor — MARC 437, 404-894-8499
Machining processes, surfaces, intelligent fixturing, and CAM/CAPP

Timothy Patterson, Assistant Professor — IPST 385, 404-894-4797
Web preheating

I. Charles I. Ume, Professor — MARC 453, 404-894-7411
Electronic packaging, mechatronics, laser moiré and laser ultrasonics

Mechanics of Materials

Laurence J. Jacobs, Professor of Civil Engineering and Environmental Engineering (Joint Appointment) — MASON 296, 404-894-2771
Nondestructive evaluation, wave propagation in solids, and experimental mechanics

Iwona Jasiuk, ~~Associate~~ Professor — MRDC 4110, 404-894-6597
Micromechanics, elasticity, fracture, composite materials, nano and biomaterials

Steve Johnson, Professor of Materials Science and Engineering — LOVE 166

(Joint Appointment) 404-894-3013
Fatigues, fracture mechanics, and durability of materials and structures

W. Jack Lackey, Professor MARC 458
Nuclear fuel and waste processing, ceramic and metallic coatings, composites, and rapid prototyping 404-894-0573

Christopher S. Lynch, Associate Chair for Administration and Professor -MRDC 3218 & 4105
404-894-6871
4-6871
Experimental mechanics, smart materials

David L. McDowell, Carter N. Paden, Jr. Distinguished Chair in Metals Processing and Regents' Professor MRDC 4105
404-894-5128
Material deformation and damage, constitutive laws, and metals processing

Richard W. Neu, Associate Professor MRDC 4102
Fatigue, deformation, and degradation of materials 404-894-3074

Jianmin Qu, Professor MRDC 4108
Fracture, composite materials, wave propagation, and microelectronic packaging 404-894-5687

Min Zhou, Associate Professor MRDC 4109
Micro- and nanoscale behavior, continuum and molecular dynamics modeling, experimental/computational mechanics, dynamic behavior and fracture 404-894-3294

Microelectromechanical ~~Engineering~~Systems

F. Levent Degertekin, Assistant Professor— LOVE 320
Micromachined sensors and actuators, ultrasonics, atomic force microscopy, and nondestructive evaluation 404-385-1357

James Gole, Professor of Physics (Joint Appointment) HOWEY
Nanostructured materials, porous media, sensors, and micro- and nanocatalysis 404-894-4029

Samuel Graham, Assistant Professor LOVE 339
Microscale heat transfer, thermophysical properties, nanostructured materials, nanodevices, and device reliability

Peter J. Hesketh, Professor LOVE 317
Microfabrication, micromachining, sensors, actuators, biosensors, and microfluids 404-385-1358

William R. King, Assistant Professor LOVE, 206
Micro/nanoscale heat transfer and thermal processing, atomic force microscopy, MEMS and micro/nanofabrication 404-385-4224

Wenjing Ye, Assistant Professor LOVE 316
CAD design of MEMS, microfabrication and numerical analysis 404-385-1301

Nuclear and Radiological Engineering/Medical Physics

Said I. Abdel-Khalik, Southern Nuclear Distinguished Professor — LOVE 324
Reactor engineering and thermal-hydraulics, two-phase flow and heat transfer; and inertial fusion technology — 404-894-3719

Cassiano R. E. de Oliveira, Professor — NEELY 104
Numerical radiation transport, computational fluid flow and molecular flow, and numerical modeling — 404-385-4928

Nolan E. Hertel, Professor — NEELY 113
Radiation shielding, neutron dosimetry, radiological assessment, radioactive waste management, accelerator sources and applications, and high-energy particle transport — 404-894-3717

Farzad Rahnema, Associate Chair of the Woodruff School, Chair of the Nuclear and Radiological Engineering/Medical Physics Program, and Professor — NEELY 122 — 404-894-3731
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 — 404-894-3714
Fusion engineering, plasma physics, and reactor physics

C.-K. Chris Wang, Associate Professor — NEELY 120
Radiation detection and dosimetry, medical and industrial applications of ionizing radiations, and spent nuclear fuel measurements — 404-894-3727

Tribology

Itzhak Green, Professor — MRDC 4209
Hydrodynamic lubrication, vibrations, rotordynamics, fluid sealing, design, and diagnostics — 404-894-6779

Richard F. Salant, Georgia Power Distinguished Professor in Mechanical Engineering — MRDC 4205 — 404-894-3176
Fluid mechanics, fluid sealing, lubrication and tribology

Jeffrey L. Streator, Associate Professor — MRDC 4206
Computer-disk tribology, thin-film lubrication, capillarity, and contact mechanics — 404-894-2742

Ward O. Winer, Eugene C. Gwaltney, Jr. Chair of the Woodruff School and Regents' Professor — MRDC 3214 — 404-894-3200
High-pressure rheology, lubrication, tribology, thermomechanics, mechanical systems diagnostics

Academic Professionals,

Jeffrey Donnell, Academic Professional and Coordinator of the Frank K. Webb Program in Professional Communications — MRDC 3104 — 404-894-8568

Kristi Lewis, Academic Professional and Undergraduate Academic Advisor	MRDC 3108 404-894-3205
David Sanborn, Senior Academic Professional and Associate Chair for Undergraduate Studies Design, thermodynamics, and combustion	MRDC 3103 404-894-7502
Michael Stewart, Academic Professional Engineering design graphics, computer-aided design, advanced feature-based parametric solid modeling, and rapid prototyping	MRDC 2212 404-385-1224
Wayne Whiteman, Director of the Office of Student Services and Senior Academic Professional Vibrations, structural dynamics, nonlinear dynamics, and engineering education	MRDC 3102 404-894-3218

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