

# **MSE 1001: Introduction to Engineering**

## **Fall 2005**

### **Learning Objectives**

The principal objectives of the course are to provide a general introduction to the field of engineering; to convey the social, professional, and ethical responsibilities of engineers and why they are important to an engineering education; to introduce the undergraduate engineering programs available at Georgia Tech; to convey the importance of contemporary issues in engineering; to introduce to the teamwork approach to engineering; and to provide a general description of the skills needed to become a practicing engineer.

### **Classroom**

Thursday 3:05 – 3:55 pm  
Room 2406 MRDC1

### **Instructor**

W.B. Carter, room 351 Love building, 894-6762, [brent.carter@mse.gatech.edu](mailto:brent.carter@mse.gatech.edu)  
Office Hours: MT 10 – 11 am

### **Teaching Assistants**

Richard Gilstrap, room 222 MaRC, 894-1861, [gte549x@mail.gatech.edu](mailto:gte549x@mail.gatech.edu)  
Michael Middlemas, room 363 Love, 385-2332, [gtg235n@mail.gatech.edu](mailto:gtg235n@mail.gatech.edu)

### **Course Book**

Henry Petroski, To Engineer is Human: The Role of Failure in Successful Design, Vintage Books, New York, 1992, ISBN 0-679-7316-3.

### **Additional References**

- Paul H. Wright, Introduction to Engineering, Wiley, New York, 1994, ISBN 0-471-57930-0.
- Henry Petroski, Design Paradigms: Case Histories of Error and Judgement in Engineering, Cambridge University Press, New York, 1998, ISBN 0-521-46649-0.
- Henry Petroski, Invention by Design, Harvard University Press, Cambridge, MA, 1996, ISBN 0-674-46367-6.
- Henry Petroski, Remaking the World: Adventures in Engineering, Vintage Books, New York, 1997, ISBN 0-375-70024-2.
- Raymond B. Landis, Studying Engineering: A Road Map to a Rewarding Career, Discovery Press, Los Angeles, CA, 1995, ISBN 0-9646969-0-8.

### **Class Attendance and Grading Policy**

- Class attendance is essential for meeting the course objectives. Therefore, unexcused absences, tardiness, and not paying attention in class can lead to a grade penalty. Attendance will be taken during each class by having students sign a class roll.
- The course grade will be based on homework (20%), an in-class mid-term examination (20%), a final examination (40%), and a team report (20%).
- Midterm grades will be reported as “S” (satisfactory) or “U” (unsatisfactory) on September 30. A “U” will indicate unsatisfactory performance, i.e., a “D” or “F”. The midterm grade will be determined by the grades on the preliminary team report and submitted homework.

### **Academic Integrity**

Students are expected to abide by the Georgia Tech Honor Code and avoid any instances of academic misconduct, including but not limited to:

1. Possessing, using, or exchanging improperly acquired written or oral information in taking an exam.
2. False claims of performance on submitted work.
3. Substitution of material that is wholly or substantially identical to that created or published by another individual or individuals, i.e., plagiarism.

“Plagiarism is using others' ideas and words without clearly acknowledging the source of that information.” (quote from <http://www.indiana.edu/~wts/wts/plagiarism.html>) An example would be incorporating information found on the internet into a paper without providing the appropriate reference.

In this course, students are encouraged, and allowed, to work together on the homework assignments. Simply copying someone else's work is unacceptable.

***Any student suspected of violating the Honor Code will be referred to the Georgia Tech Office of Student Integrity.***

## Team Report

Students will be assigned to a team and each team will write a report. One objective of this assignment is to give students the experience of working in teams of several students with each contributing to the success of the endeavor. Another equally important objective is to provide experience in technical writing and communication.

At the end of the semester, each team member will confidentially rate the contributions of fellow team members. This information will be considered in assigning individual grades for the report. Thus, all members of a team may not necessarily receive the same grade on the team report.

- Topic

Each team must choose a report topic and define the scope of the report. Any topic related to the learning objectives of the course will be acceptable. Reports describing engineered products, such as fuel cells, genetically engineered materials, miniature turbine powered aircraft or biomimetic materials, are acceptable.

- Preliminary Report

Each team must submit a hard copy of a preliminary report by the end of class on September 29. It must be no longer than two pages, typed double-spaced with appropriate margins on all sides. Teams submitting late reports will be penalized.

The preliminary report must include an appropriate title, a brief description of the topic, a tentative outline of the report, and team member assignments that indicate a clear division of responsibilities.

- Draft Final Report

Each team must submit a draft final team report by the end of class on November 4. Teams submitting late reports will be penalized. The draft final report will be edited and returned on November 11.

- Final Report

The final reports are due by the end of class on November 18. The reports will be graded on the technical content and rigor as well as its effectiveness in communicating the teams' findings. Teams submitting late reports will be penalized.

The report must be no longer than 10 pages including all figures, tables, and references. Use a 12 point font and double space the text. The report must consist of the following sections:

- Cover page with title and names of authors (team members) in alphabetical order (cover page does not count against the 10 page limit).
- Summary (100 words or less **summarizing** – not introducing – the report)
- Introduction and background
- Presentation of findings
- Conclusions
- References (**numbered** sequentially as they appear in the text)

Figures and tables may be placed in the text or collected in separate sections immediately before the references.

## Class Schedule

Date	Class #	Topic	Instructor
Aug. 25	1	Course Overview & Case Studies: Engineering Failures	Carter
Sept. 1	2	What is Engineering? (Fields of Engineering/Careers in Engineering)	Carter
Sept. 8	3	Data Collection and Analysis	Carter
Sept. 15	4	Technical Communications and its Importance in Engineering Practice	Dr. Lisa Rosenstein
Sept. 22	5	Contemporary Issues in Materials Science	Dr. Bob Snyder
Sept. 29	6	The Engineering Profession (Registration/Responsibilities/Organizations) & Career Counseling at Tech - <b><i>Preliminary team reports due</i></b>	Carter/Ms. Kirstin Young (Career Services)
Oct. 6	7	<b><i>Mid-Term Examination &amp; PIZZA!</i></b>	
Oct. 13	8	Risk and Reliability	Carter
Oct. 20	9	Reliability Modeling at Lockheed-Martin Aero	Mr. Chuck Tucker (Lockheed-Martin)
Oct. 27	10	Fifth Street Bridge	Mr. Paul Liles (GA DOT)
Nov. 3	11	Linear Cellular Alloys	Dr. Joe Cochran
Nov. 10	12	Case Study: Fiber Optics - <b><i>Draft final team reports due</i></b>	Carter
Nov. 17	13	The Engineer as Entrepreneur	Dr. Andrew Hunt (nGimat)
Nov. 24		<b><i>Thanksgiving Holiday</i></b>	
Dec. 1	14	Professional Ethics – <b><i>Final team reports due</i></b>	Carter
Dec. 8	15	Case Study: The Development of Materials for use in Gas Turbines	Carter
Dec. 15		<b><i>11:30 – 2:20, Final Examination (Tentative)</i></b>	