

**UNIVERSITY OF DELAWARE**  
MSEG 302  
Spring 2006

**Materials Science for Engineers**

**Class Instructors:** Prof J. W. Gillespie, Jr., 201 Composites Mfg Sc Lab, 831-8702 (ph), 831-8525 (fax)  
E-Mail: [gillespie@ccm.udel.edu](mailto:gillespie@ccm.udel.edu)

Prof D. Pochan, 201 DuPont Hall, 831-3659 (ph), 831-4545 (fax)  
E-Mail: Pochan@udel.edu

Guest Lecturers: To Be Announced

**Office Hours:** Immediately following lectures and by appointment.

**Class: MW 12:20pm – 1:35pm; 100 Wolf Hall**

Class Website: [http://www.ccm.udel.edu/Personnel/homepage/class\\_web2006/index.html](http://www.ccm.udel.edu/Personnel/homepage/class_web2006/index.html)

Check website for latest news, homework assignments, lecture notes, quiz and exam dates and more.

**Required Text:** “The Science and Engineering of Materials” Fifth Edition  
by D. R. Askeland and P. P. Phule

This course aims to provide an understanding of the general behavior of the different types of materials, and the relationship between material properties and material structure.

**Required Software: CES EduPack 2005: Materials Selection for Design**  
Software will be used in a term project.

**TA's and GRADER's:** TA's will be available during Review Sessions or contact them by email to set-up appointments. Two TA's will be present at each Review Session. Three TA teams will be established (A, B and C). Two TA's will have primary responsibility for grading.

Kristin Sisson (G)  
E-Mail: ksisson@UDel.Edu

Beverly Wright (B)  
E-Mail: bwright@UDel.Edu

Aysegul Altunbas (A)  
E-Mail: aysegul@UDel.Edu

Alexandra Farran (C)  
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Ohm-Divyam Krishna (A)  
E-Mail: ohm@UDel.Edu

Sheng Zhong: (C)  
E-Mail: szhong@UDel.Edu

William Kerr (B)  
E-Mail: bkerr@UDel.Edu

Solange Amouroux (CES Software Only, D)

**TA Discussion/Office Hours/Review Sessions**

Monday	Sharp 107 6:30-7:30pm
Tuesday	McDowell 204 1:00-2:15pm
Wednesday	Sharp 107 6:30-7:30pm
Thursday	Sharp 107 6:30-7:30pm
Friday	Colburn 104 11:15am-12:15pm

## COURSE OUTLINE

The following tentative schedule is an outline of the course. Each Chapter is a reading assignment.

Be sure to use your Textbook CD to compliment the text information.

Check the website frequently to get updates on class lectures.

### MSEG 302 Lectures

Feb 8	Chapter 1 Introduction to Materials Science and Engineering (JWG)
Feb 13	Chapter 2 Atomic Structure (DP)
Feb 15	Chapter 3 Atomic and Ionic Arrangement (DP)
Feb 20	Chapter 4 Imperfections in Atomic Arrangement (DP)
Feb 22	Chapter 5 Atoms and Ion Movement (JWG)
Feb 27	<b>Quiz #1 (TA's) Chapters 1-3</b>
March 1	Chapter 6 Mechanical Properties: Part One (JWG)
March 6	Chapter 7 Mechanical Properties: Part Two (JWG)
March 8	Chapter 8 Strain Hardening and Annealing (JWG)
March 13	Chapter 9 Principles of Solidification (JWG)
March 15	<b>EXAMINATION #1 Chapters 1-7 (TA's)</b>
March 20	Chapter 10 Solid Solutions and Phase Equilibrium (DP)
March 22	Chapter 11 Dispersion Strengthening and Eutectic Phase Diagrams (DP)
March 27-31	<b>SPRING BREAK</b>
April 3	Chapter 12 Dispersion Strength by Phase Transformation and Heat Treatment (DP)
April 5	Materials Selection (JWG)
April 10	Materials Selection and Chapter 13 Heat Treatment of Steels and Cast Irons (JWG)
April 12	<b>Quiz #2 Chapter 8-11 (JWG)</b>
April 17	Chapter 15 Ceramic Materials (DP)
April 19	Chapter 16 Polymers (DP)
April 24	Chapter 17 Composites (JWG)
April 26	Chapter 18 Construction Materials (JWG)
May 1	Chapter 14 Nonferrous Alloys (JWG)
May 3	<b>EXAMINATION #2 Chapters 8-17</b>
May 8	Chapter 19 Electronic Materials (DP)
May 10	Chapters 20 Magnetic Materials (DP)
May 15	Nano-materials (DP)
May 17	Bio-materials (DP)
May 22-26	<b>FINAL EXAM WEEK</b>

**MSEG 302 TA Office Hours: Held During Review Sessions**

(Contact TA's by email for other meeting times)

Week	TA	
February 6-10		No office hours during first week of class
February 13-17	ABCD	Software Tutorial in 106 CMSL (Corner of Delaware and Academy Street)
February 20-24	A	Review Sessions for Chapters 1-3; Quiz 1 on Chapters 1-3
Feb 27-March 3	B	Review Sessions for Chapters 4-5
March 6-10	C	Review Sessions for Chapters 6-7; Exam 1 on Chapters 1-7
March 13-17	A	Review Sessions for Chapters 8-9
March 20-24	B	Review Sessions for Chapters 10-11
March 27-31		SPRING BREAK
April 3-7	C	Review Sessions for Chapters 12-13; Quiz 2 on Chapters 8-12
April 10-14	A	Review Sessions for Chapters 14; Quiz 2 on Chapters 8-12
April 17-21	B	Review Sessions for Chapters 15-16
April 24-28	C	Review Sessions for Chapters 17; Exam 2 on Chapter 8-17
May 1-5	AD	Review Sessions for Chapters 18 and Materials Selection Project
May 8-12	BD	Review Sessions for Chapters 19-20 and Materials Selection Project
May 15-19	ABC	Review Sessions: Final Exam

**Materials Selection Software Tutorial in 106 CMSL (Corner of Delaware and Academy Street): February 13-17**

Solange Amouroux will give an introductory lecture and software demonstration. You will need to learn the software for your project.

Monday	106 CMSL 6:30-7:30pm
Wednesday	106 CMSL 6:30-7:30pm
Thursday	106 CMSL 6:30-7:30pm
Friday	106 CMSL 11:15am-12:15pm

**MSEG 302 TA Office Hours/Review Sessions**

Monday	Sharp 107 6:30-7:30pm
Tuesday	TBD
Wednesday	Sharp 107 6:30-7:30pm
Thursday	Sharp 107 6:30-7:30pm
Friday	Colburn 104 11:15am-12:15pm

**MSEG 302 Grading**

Exam I:	20%
Exam II:	20%
Final Exam:	20%
Quizzes	20%
Project	20%

A:	93-100
A-:	90-92
B+:	87-89
B:	83-86
B-:	80-82
C+:	77-79
C:	73-76
C-:	70-72
D+:	67-69
D:	63-66
D-:	60-62

Homework is assigned by Chapter and are listed on the website. Homework solutions will be covered in review sessions. Homework will not be graded. Quizzes will cover homework and Chapter reading assignments.

Lecture notes, homework assignments, syllabus, calendar and ABET Competency Matrix are online. The Class Home Page will provide the latest news for the class. Check frequently for any changes!

Report Guidelines for the Materials Selection Project can be found on the Class Home Page.

Make-up exams will be offered only to those students who present doctor's certificate or make other arrangements in advance of the tests.