

# MSE5322

## Microstructural Characterization of Materials

- Instructor: Prof. Bryan D. Huey
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- Lecture Location: ITE, room 127
- Lecture day/time: every F, 2-5 pm
- Final exam: take-home
  - due Monday, December 14, 4:30pm

### Textbook:

- Microstructural Characterization of Materials, 2<sup>nd</sup> ed.
  - by D. Brandon and W.D. Kaplan, John Wiley and Sons, Inc. (2008).
- Some additional course material will be distributed and/or uploaded to the course web site, reached from:  
<http://www.ims.uconn.edu/~bhuey/>



# Course Goals

- To introduce fundamental concepts of microstructural characterization, including theory, interpretation, equipment, and limitations.
- To help you identify appropriate characterization techniques for research, and analyze the results.

# Demonstrations

- Demonstrations and lab visits to various IMS facilities will be arranged throughout the term. They will be led by the appropriate IMS staff member, at times TBD.
- These visits will provide opportunities to:
  - Review local instrumentation / capabilities
  - Reinforce concepts from lectures
  - Meet the staff who will help you with your research
- These are not obligatory, but are highly recommended.



# Syllabus

Lecture	Date	Topic	Chapter	Remarks
1	4-Sep	Course Details; Microstructure; Crystallography	1	
2	11-Sep	Optical Microscopy	3	
3	18-Sep	Scanning Electron Microscopy	5	HW1 due
4	25-Sep	Scanning probe microscopy	7	
5	2-Oct	<b>Lab Visits (No Class)</b>		HW2 due
	9-Oct	<b>No Class</b>		
6	16-Oct	Diffraction I	2, handout	
7	23-Oct	Diffraction II	2, handout	
8	30-Oct	Transmission Electron Microscopy	4	HW3 due
9	6-Nov	Chemical Analysis in EM: EDAX and EELS	6	
10	13-Nov	Surface Analysis-SIMS, RBS	handout	HW4 due
11	20-Nov	Focused Ion Beam	handout	
	<b>27-Nov</b>	<b>Thanksgiving Week: No Class</b>		
12	4-Dec	Surface Analysis-XPS, AES, Raman	8	HW5 due
	<b>14-Dec</b>	<b>MONDAY: Take-home Final Exam due <u>4:30 pm</u></b>		



# Assessment

- Extensive Homework Assignments ( $5 \times 14\% = 70\%$ )
  - Hand in at the start of class on the due date
- One comprehensive take-home final exam (25%)
  - Due Monday, December 14, 4:30 pm
- In class quizzes (5%)

No in-class quizzes / exams

term score	term grade	term score	term grade
>92	A	>72	C
>90	A-	>70	C-
>88	B+	>68	D+
>82	B	>62	D
>80	B-	>60	D-
>78	C+	<	F



# Policies and Procedures

- All homeworks are due by the *start* of class on the stated deadline.
  - If you submit the assignment later during class, you will lose 5%.
  - if you submit the assignment later that night (under my door, with an email telling me it is there), you will lose 10%
  - For every day later (by 4:30pm), you lose another 10%. Beyond a week, no credit is assigned.
  - **Late assignments go to my office, not my mailbox.**
    - If I'm not around, slide it under my door and ***leave me a voicemail or email*** so that I know when you turned it in.
- If you wish, you may work together on homework assignments. **BUT, you must hand in your own work, in your own words.**
- You **MAY NOT** work together on the final exam.



# More Policies and Procedures

- Homeworks and exams will draw from, and be graded on:
  - class discussions
  - class notes
  - lab visits
  - course textbooks
  - **additional material you research on your own**
    - **You are expected to go beyond what you learn in class/read in the text for the assignments and exams.**



# Plagiarism

- During assignments, you are encouraged to seek external sources. However, your answers must be in your OWN words. You may use figures from elsewhere, in which case they must be referenced as follows:
- **Books**
  - book authors, title, publisher, year, pages
- **Journal articles**
  - article authors, title, journal, volume, year, pages
- **web sites, etc.**
  - web address
- Copies of text/answers are NOT acceptable. Plagiarism software will be used occasionally to check for un-sited references.



# UConn Plagiarism Policy

- Plagiarism involves using another's work without attribution, as if it were one's own original work. It is considered an ethical offense and can be detrimental to one's academic reputation and integrity.
- For serious offenses, typical sanctions are generally considered to be failure in the course. For less serious offenses, it is generally failure in that portion for which you are accused of academic misconduct.
- In response to especially egregious circumstances surrounding a particular instance of academic misconduct, the Director of Community Standards may initiate a review of the student's academic transcript and judicial record that could result in a more severe sanction...
  - possibly expulsion

