Credits and contact hours

1 Credit. Friday (9:30am-12:20pm), Other times available on request via e-mail

Instructor’s or course coordinator’s name

Dr. Zhenhai Xia

Text book, title, author, and year

Reporting Results – A Practical Guide for Engineers and Scientists, by David C. Van Aken and William F. Hosford

a. Other supplemental materials

The instructor will provide the laboratory manual and references.

Specific Course Information

a. Brief description of the content of the course (catalog description)

Laboratory designed to introduce students to some of the most common materials testing, characterization and computational methods. Topics will include polymer, glasses, nanocomposites and computational materials.

b. Prerequisites or co-requisites

ENGR 2332 3450

c. Indicate whether a required, elective, or selected elective course in the program

Required

Specific goals for the course

a. Specific outcomes of instruction

1. Students will learn how to conduct module-specific processing or computational techniques (e.g., heat-treatments, sintering, thin films
2. Students will learn how to characterize materials using the different techniques specific to each of the modules (e.g., optical microscopy, TGA, DSC, X-Ray Diffraction, EDS, finite element analysis)
3. Students will collect, analyze, and interpret data in teams and will share data with other teams assigned to other roles within each lab module.
4. Students will learn materials structure-property relationships for each module
5. Students will analyze and interpret data related to each of the modules and present the data in the form of original laboratory reports conforming to research and academic standards
6. Students will learn to relate concepts learned in the lab modules involving modern engineering tools to solve practical engineering problems

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes that are addressed by the course.

This course addresses ABET Criterion 3 Student Outcome(s): 1, 3, 5, 6, 7 and Program Outcomes 1, 2, 4, 5, 6, 7, 11.

**Brief list of topics to be covered**

1. Introduction (1 week)
2. Computational materials (4 weeks)
3. Polymer processing (4 weeks)
4. Ceramic processing – Glass melting (4 weeks)

**Course Requirements:** Mandatory attendance. No required text. Handouts will be provided.

**COVID-19 Impact on Attendance**

While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.

If you are experiencing any symptoms of COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive
test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

**Class Materials for Remote Instruction**
The UNT fall schedule requires this course to have fully remote instruction beginning November 28th. Additional remote instruction may be necessary if community health conditions change or you need to self-isolate or quarantine due to COVID-19. Students will need access to a [webcam and microphone – faculty member to include what other basic equipment is needed] to participate in fully remote portions of the class. Additional required classroom materials for remote learning include: [list specific software, supplies, equipment or system requirements needed for the course]. Information on how to be successful in a remote learning environment can be found at https://online.unt.edu/learn.

**Grading:** Class participation is required for each of the labs. Lab reports are due at the end of each session (e.g. polymer, electronic, etc …). Grading is based on class participation and the reports.

**Class participation:** 10%, **computational materials:** 30%, **polymers:** 30%, **ceramic:** 30%

**LAB Reports:** The lab includes four modules, in which class projects are signed. After the lab experiments are completed, the students are required to write project reports summarizing his or her work on their class lab modeling. This report must be typed, single spaced, 12 point Symbol and/or Times New Roman fonts, and with 1-inch margins around. The report will follow the style of a standard laboratory report and must include the following sections: Title, Author and affiliation, Abstract, Introduction (of the method used and properties calculated), Results, Discussions (comparing the results with corresponding experimental values, or theory), Conclusions, and References. You must include appropriate visual figures from the experiments/simulations (including charts and graphs, and material structures). All the legends and labels in the charts and graphs must be at least a 12-point font when scaled to fit to the report.

**Statement on Face Covering**
Face coverings are required in all UNT facilities. Students are expected to wear face coverings during this class. If you are unable to wear a face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated via the instructor.
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