Course Syllabus

Course Information

Course Prefix, Number, Section	*MECH 4360.001*
Course Title	*Introduction to Nanostructured Materials*
Term	*Spring 2026*
Days & Times	*Monday, Wednesday 8.30am – 9.45 am*

Professor Contact Information

Professor	*Amy V. Walker*
Office Phone	*972 883 5780*
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Email Address	*amy.walker@utdallas.edu*
Office Location	*RL 3.714*
Office Hours	*TBA*
Teaching Assistant(TA)	*TBA*

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisites: MECH 2320, MECH3310

Course Description

The emphasis in this course is to introduce the science of the building blocks of nanostructured materials, their chemical and structural characterization, material behavior, and the technological implications of these materials. Special attention is devoted to presenting new developments in this field and future perspectives.

Student Learning Objectives/Outcomes

1. Explain the nanoscale paradigm in terms of properties at the nanoscale dimension.
2. Identify appropriate fabrication techniques for different types of nanostructures.
3. Identify appropriate characterization techniques to measure physical, chemical, structural, and functional properties of nanostructures.
4. Apply key concepts related to materials science, engineering, chemistry, physics and biology, to the field of nanotechnology.
5. Evaluate the historical development, current status, and potential future directions of nanotechnology solutions in design, engineering, and manufacturing.

Required Textbooks and Materials

Required Texts

"Nanotechnology: Understanding Small Systems", Third edition, Ben Rogers, Jesse Adams, Sumita Pennathur, CRC Press, ISBN: 978-1-138-07268-8. Available on-line from the library.

Suggested Course Materials

Suggested Readings/Texts

"Introduction to Nanoscience", G.L. Hornyak, J. Dutta, H.F. Tibbals, A.K. Rao, CRC Press, ISBN: 978-1-4200-4805-6. Available on-line from the library.

"Introduction to Nanoscience", S.M.Lindsay, Oxford ISBN 978-019-954421-9 (2010). Available on-line from the library.

Information will also be provided on the e-learning web site and in class handouts.

Assignments & Academic Calendar

Topics, Reading Assignments, Due Dates, Exam Dates

Week of	Material
January	
21	Introduction
26	Societal Implications of Nanoscience and Nanotechnology
February	
2	Scaling Laws
9	Nanoscale Physics
16	Nanomaterials
23	Nanomaterials Nanomechanics
March	
2	Nanomechanics Nanoelectronics
9	Nanoelectronics
11	**Exam 1**
16-20	**Spring Break**
23	Nanoscale heat transfer
30	Nanoscale heat transfer/ Nanophotonics
April	
6	Nanophotonics / Nanoscale fluid mechanics
13	Nanoscale fluid mechanics
20	Natural Nanomaterials
27	Biomolecular Nanoscience
29	**Presentations**
May	
4	**Presentations**
6	**Exam 2**

Homework and "quizzes" will be regularly assigned and solutions posted on the e-Learning web site one week later.

Note: This is a tentative schedule and may be changed at the discretion of the faculty.

Grading Policy

Quizzes 15%; Homework 15 %; Exam 1 20 %; presentation 15%; Tiny Tech radio script 15%; Exam 2 20 %

Course Policies

Homework and Quiz Assignments
These are due no later than THE START OF CLASS. No exceptions.
Assignments will be posted on the e-learning site for this course as well as provided in class.
Homework and quizzes must be presented in a professional, legible manner to be graded.

Exams
Students may return exams having significant grading errors for reconsideration by the professor. A significant error constitutes a ≥ 3 point error on the grading of a single question. The professor will not view favorably regrade requests involving 1 or 2 points or minor errors in a series of several questions. Students must submit concise, clear explanations along with the exam to be re-graded within 1 week after return of the exam. No markings or other alterations should be made to the exam. Acceptable explanations are 1) the answer key is incorrect or incomplete, 2) the student solution is equivalent or equally valid to that given on the key, and 3) the student gave the same answer on the key but was not recognized to have done so. To ensure fair and equal treatment to all students, all changes to the exam score must be made via this process. The professor will not meet with students to discuss the exam score changes.

Make-up exams
No make up exams will be given except under extreme circumstances.

Extra Credit
Not offered.

Late Work
Not accepted.

Special Assignments
None.

Class Materials
The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Attendance

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes.

Class Participation

Regular class participation is expected regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

The instructor may record lectures for this course in the event of an unforeseen absence. These recordings will be made available to all students registered for this class. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the AccessAbility Resource Center has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Accommodations for Students with Disabilities

Please review the section within the UT Dallas Syllabus Policies and Procedures webpage.

Academic Support Resources

Please visit the Academic Support Resources page to view the University's academic support resources for all students.

UT Dallas Syllabus Policies and Procedures

Please visit the Syllabus Policies page to view the University's policies and procedures segment of the course syllabus.

Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.