

Course number and name

Special Topics in Materials Science & Engineering (MTSE4100)

Credits and contact hours

3 Credits. F 3:00pm - 3:50pm; Additional two hours with advisor

Instructor's or course coordinator's name

Instructor: Narendra Dahotre

Text book, title, author, and year

a. *Other supplemental materials*

This is an instructor guided literature search and instructor provided handouts.

Specific Course Information

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

The primary objective of this course is to provide every student with experience in a materials engineering specific research project involving science and technology that draws on many of the skills that have been mastered during their studies in materials related courses. Students will be taught and guided to develop an ability to conduct research through independent literature search, thinking, understanding and development of the concept, and execution of theoretical and experimental plans followed by interpretation of the observations and results. A specific topic for the work within the perimeters of this course will be selected based on mutual interests.

b. *Prerequisites or co-requisites*

MTSE 3010, MTSE 3020, MTSE 3030, MTSE 3040, MTSE 3050, MTSE 3070, MTSE 3080, MTSE 4090.

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

Required

Specific goals for the course

a. *Specific outcomes of instruction*

- Students are expected to function in an environment that is more similar to that which they will encounter in their careers outside the university setting. As such, instructors have two main functions: to serve as advisors to the senior design student/teams and as evaluators of student/team progress.

- Students are *expected to operate effectively either as an individual or in a team environment*; team evaluations will be compiled at the end of the semester using the attached rubric.
 - Students will succeed by *exhibiting an ability to apply and integrate knowledge of material structure, properties, processing and performance for a materials selection and process design problem*.
 - Students should consider additional aspects such as the economic, environmental, ethical, safety as well as social and political impacts of the effort.
- b. *Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

This course addresses ABET Student Outcome(s): a, b, e, g, j, k

Course Schedule: Meets every other Friday at 3 PM at convenient location (laboratory, conference room, etc.)

- Session 1:** Review of potential project topics and course expectations
Session 2: Short presentation and discussion of specific project topic selected by the student
Session 3: Review of progress and research goals
Session 4: Presentation of project outline including definition, objectives, expected outcome, and project execution timeline (GANTT charts)
Session 5: **Preliminary project progress DUE** –5 min presentation, questions and answers
Session 6: Review
Session 7: **Project progress written report DUE** – Report & 5 min presentation, questions and answers
Session 8: Review
Session 9: **Oral Presentations**
Session 10: **Final Report DUE**

Grading:

Students will be evaluated based on progress reports submitted to advisors, team evaluations, prepared presentations and written reports. Grades will be assigned for each task and group members will evaluate the group's performance during the semester. Points will be based on the following.

Project outline including timeline (GANTT chart)	25
Project Progress Report (project design goals and updated state of the art literature review)	50
Draft Final Report (project background, literature, plan, accomplishments)	25
Oral Presentations	100
Final Report (Project background, literature, plan, design of experiments, accomplishments)	100

Grades will be assigned using the following scale: A>90%>B>80%>C>70%>D>60%>F

Individuals/Groups are responsible for planning their own meetings outside of class to complete the project and for scheduling time with the faculty advisor and industrial sponsor (if appropriate). Review the educational objectives carefully to determine additional details that should be considered in all senior design presentations and written reports.