

**New Jersey Institute of Technology
Department of Engineering Technology
MET 401 Mechanical Design Project I**

COURSE NUMBER	MET 401
COURSE NAME	Mechanical Design Project
COURSE STRUCTURE	2-0-2 (lecture hr/wk - lab hr/wk – course credits)
COURSE COORDINATOR/ INSTRUCTOR	Dr. A. Sengupta/See Department
COURSE DESCRIPTION	Project and lecture applies the principles learned in all technical courses to more advanced design situations. Proposal of a typical mechanical engineering system is presented by an individual or by small groups. The proposal must meet the approval of course instructor. A formal proposal is required.
PREREQUISITE(S)	MET 302, MET 303, MET 304, MET 314, ECET 329, Eng 352.
COREQUISITE(S)	None
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	Required
REQUIRED MATERIALS	None.
COMPUTER USAGE	Microsoft Office, Visio, MSProject, CAD
COURSE LEARNING OUTCOMES (CLO)	By the end of the course students should be able to: <ol style="list-style-type: none">1. Prepare detailed schedules using Visio or MS Project.2. Organize a design review meetings and submit the minutes.3. Provide references for research material that increased their technical knowledge as required for their project.4. Develop a detailed design proposal in technical report format.5. Perform a mechanical analysis of their design.6. Give an oral presentation their proposed design project.7. Develop an awareness of professional ethics and regulatory bodies.
CLASS TOPICS	Preliminary Project Proposal, Meeting Minutes, Project Log Book, The Design Proposal, Design Proposal Organization, Three Individual Design Review Meetings with Instructor, Three Group Design Review Meetings, Presentation of Preliminary Project Proposals, Project Time Scheduling, Project Planning Overview Presentation, Project Cost Estimating, Professional Ethics, Design Proposal Presentations

STUDENT OUTCOMES

The Course Learning Outcomes support the achievement of the following MET Student Outcomes and TAC of ABET Criterion 9 requirements:

Student Outcome d - an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.

Related CLO – 4, 5

Student Outcome e - an ability to function effectively as a member or leader on a technical team.

Related CLO - 2

Student Outcome g - an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.

Related CLO – 3, 4, 6

Student Outcome h - an understanding of the need for and an ability to engage in self-directed continuing professional development.

Related CLO – 7

Student Outcome i - an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity team.

Related CLO - 7

Student Outcome j - a knowledge of the impact of engineering technology solutions in a societal and global context.

Related CLO - 7

Student Outcome k - a commitment to quality, timeliness, and continuous improvement.

Related CLO - 1

Student Outcome m - technical expertise having added technical depth in mechanical design, solid mechanics, and electro-mechanical devices and controls.

Related CLO - 5

ACADEMIC INTEGRITY

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students'

permanent record. Avoid situations where honorable behavior could be misinterpreted. For more information on the honor code, go to <http://www.njit.edu/academics/honorcode.php>

STUDENT BEHAVIOR

See Individual Instructor Policies, which can include:

- No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories.
- Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate.
- No headphones can be worn in class.
- Unless the professor allows the use during lecture, laptops should be closed during lecture.

MODIFICATION TO COURSE

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline.

Grading:	Preliminary Project Proposal	10%
	Project Log Book	10%
	Meeting Minutes	15%
	Design Proposal Oral Presentation	15%
	Design Proposal	40%
	Merit	10%

Course Rules and Regulations:

1. Attendance in class is mandatory. If you must miss a class, notify the instructor by email before the class meeting. If that is not possible, due to extenuating circumstances, then notify the instructor by email immediately when possible. 2 or more unexcused absences will result in failure of the course.
2. All presentations must be done using Power Point.
3. All drawings must be done using CAD. Analysis software should be used whenever possible.
4. Merit points are given only for exceptional work. This will include attendance in class, participation in class, quality and participation in group presentations, use of appropriate software, and quality of overall design proposal.
5. Assignments are not accepted late for any reason. If you must miss a class, please make arrangements to have someone hand in your assignment when due. The exception of course is if there is a family emergency. In such a situation, effort must be made to submit the work at the first possible time. Please note, email may be used to submit assignments in these instances

Project Log Book:

This is a daily project log. Entries should be recorded in ink, dated and signed. The logbook should include a record of anything having to do with your project, e.g., sketches, calculations, summaries of articles, conversations and/or meetings. The Project Log Book will be checked at Individual Meeting with instructor. It must be submitted with the final project proposal. It will be returned to you next semester for MET 448.

Design Review Meeting Minutes (1 page):

Please follow provided template. Minutes to a Design Review meeting should include the following:

1. Title of Topic of the Meeting
2. Location, Date and Time of the Meeting
3. Principle Presenter if appropriate
4. Names of Attendees
5. Summary of the Discussion during the meeting by person or group
6. Name and Signature of Person Recording the Minutes

Preliminary Project Proposal (3 to 5 pages):

Please follow the provided template. The preliminary proposal should include the following:

1. Project Title
2. Name of Project Designer
3. Executive Summary
4. Background Information on Project Selection
5. Concept – Clear explanation of concept and description including preliminary sketches.
6. Market Evaluation
7. Design Criteria
8. Intellectual Property Evaluation
9. Technology Evaluation

Final Project Proposal (5 to 10 pages, excluding drawings):

Includes *final* versions of 1-9 above including documentation for estimates and research information, plus the following:

10. Preliminary Engineering Design
11. Analysis & Testing Plan
12. Project Phases
13. Project Logistics
14. Preliminary Project Time Schedule (One semester, i.e., 14 weeks of work including major milestones)
15. Preliminary Cost Estimate broken down into major components

Guidelines when Selecting a Project:

1. You should be personally interested in your project.
2. The project should be doable by you within two semesters.
3. The project costs should be reasonably within your personal limits.
4. The necessary manufacturing resources should be obtainable by you.
5. The project must have an engineering design/analysis element to it.
6. The project may not have been already been started by you or someone else.
7. You must be the principle designer for this project. You may have assistance, but it must be under your personal direction.
8. Once a project is selected, it may not be changed, so select wisely.

COURSE OUTLINE

Week	Topic/Activity
1	Introduction, Preliminary Project Proposal Meeting Minutes, Project Log Book, The Design Proposal
2	Marketing Analysis Group Design Review Meeting Minutes Due (GDM-1) <i>Deliverable Due</i>
3	Individual Design Review Meeting with Instructor (IDM-1), Minutes due 1 week after meeting (First Groups)
4	Intellectual Property Individual Design Review Meeting with Instructor (IDM-1) , Minutes due 1 week after meeting (Second Groups)
5	Project Planning and Project Time Scheduling
6	Project Cost Estimating Group Design Review Meeting Minutes Due (GDM-2) <i>Deliverable Due</i>
7	All Groups Preliminary Project Proposal Reports First Groups Preliminary Project Presentation (PPP-1) <i>Deliverable Due</i>
8	Second Groups Preliminary Project Presentation (PPP-1) <i>Deliverable Due</i>
9	Individual Design Review Meeting with Instructor (IDM-2), Minutes due 1 week after meeting (First Groups)
10	Individual Design Review Meeting with Instructor (IDM-2), Minutes due 1 week after meeting (Second Groups)
11	Career Development & Engineering Ethics
12	Group Design Review Meeting Minutes Due (GDR-3) <i>Deliverable Due</i>
13	Design Proposal Report (All Groups) Design Proposal Presentations (Group 1) <i>Deliverable Due</i>

14	Design Proposal Presentations (Group 2) <i>Deliverable Due</i>
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