

**New Jersey Institute of Technology  
Department of Engineering Technology  
MET 448 Mechanical Design Project II**

<b>COURSE NUMBER</b>	MET 448
<b>COURSE NAME</b>	Mechanical Design Project II
<b>COURSE STRUCTURE</b>	0-2-1 (lecture hr/wk - lab hr/wk – course credits)
<b>COURSE COORDINATOR/ INSTRUCTOR</b>	Dr. A. Sengupta/See Department
<b>COURSE DESCRIPTION</b>	Continuation of project MET 401. Oral presentation and formal written report are required.
<b>PREREQUISITE(S)</b>	MET 401
<b>COREQUISITE(S)</b>	None
<b>REQUIRED, ELECTIVE OR SELECTED ELECTIVE</b>	Required
<b>REQUIRED MATERIALS</b>	None.
<b>COMPUTER USAGE</b>	Microsoft Office, Visio, MSProject, CAD
<b>COURSE LEARNING OUTCOMES (CLO)</b>	By the end of the course students should be able to: <ol style="list-style-type: none"><li>1. Organize a design review meetings and submit the minutes.</li><li>2. Provide references for research material that increased their technical knowledge as required for their project.</li><li>3. Prepare design change orders and implement design changes to improve their project.</li><li>4. Prepare formal progress reports that include identifying problems and resulting schedule changes.</li><li>5. Perform a mechanical analysis of their final design.</li><li>6. Develop a detailed design project report.</li><li>7. Give an oral presentation of their design project.</li><li>8. Demonstrate a working model of their final design.</li><li>9. Develop an awareness of professional ethics and regulatory bodies.</li></ol>
<b>CLASS TOPICS</b>	Review of Preliminary Project Proposal and Project Log Book, Review of Design Changes and Change Orders, Group Design Review Meeting Minutes (three required), Individual Project Progress Reports (three required), Final Design Project Presentation, Demonstration and Report.

## STUDENT OUTCOMES

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

**Student Outcome c** - an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

**Related CLO – 3**

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

**Related CLO – 3, 8**

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

**Related CLO – 1**

**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 – 2, 4, 6, 7**

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

**Related CLO - 2**

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

**Related CLO - 9**

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

**Related CLO - 9**

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

**Related CLO - 4**

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

**Related CLO - 5, 6, 7**

## 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.

<b>Grading:</b>	Individual Project Progress Reports (3)	15%
	Project Log Book	10%
	Group Design Review Meeting Minutes(3)	10%
	Final Project Report	40%
	Project Oral Presentation	15%
	Merit	10%

#### **Course Rules and Regulations:**

1. All presentations must be done using Power Point.
2. All drawings must be done using CAD. Analysis software should be used whenever possible.
3. Merit points are given for exceptional work. This will include attendance in class, participation in class, quality and participation in group presentations, use of appropriate software, and overall quality of the final project.
4. Assignments are due on time as specified in the course outline. Late assignments are not accepted late for any reason. 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.

#### **Group Design Review Meeting Minutes (1 page):**

Follow provided Template. Minutes of a Design Review meeting should include the following:

1. Groups Attending
2. Names of Attendees - Ordered by Group
3. Location, Date and Time of the Meeting
4. Itemized Summary of the Discussion During the Meeting
5. Name of Person Recording the Minutes

#### **Team Project Progress Report (1-2 pages):**

Follow provided template. Progress reports should include the following:

1. Group Number and Project Title
2. Names of Group Members
3. Progress Period Start and End Date

4. Itemized summary of progress (i.e., productive activities) during the progress period.
5. Identify any problems encountered and fixes implemented.
6. List change orders processed during the progress period.
7. List activities planned for the next progress period.
8. Report status of project relative to your planned schedule. (Show schedule and any changes).

### **Project Log Book:**

This is a continuation of your daily project log. The logbook should include anything and everything having to do with your project, e.g., sketches, calculations, summaries of articles, conversations and/or meetings. It must be submitted with the final project report. Project Log Books will be checked at the meeting with the professor.

### **Final Project Report (usually 25 to 50 pages)**

The Final Report should include the material prepared in MET 401. Use the report and template generated in MET 401. You will update the following sections

1. Engineering Design
2. Project Logistics & Cost: Will include both the proposed and where you actually landed (e.g. revised cost estimate).
3. Project Timing: Will include both the proposed and Revised schedule/Gantt chart

New Sections To Be Added:

1. Analysis and Testing
2. Summary
3. Conclusions

Sections that will be present from the previous report:

1. References
2. Appendices

Any revisions of the above should be the result of design changes required from the manufacturing and testing of your project. Design changes must be documented by a change order when it is made. This means that whenever you make a change to your original submitted design, you must submit a design change document detailing what the change is and why it is necessary. This documentation must be submitted when the change is made, not at the end of the semester. The format for the design change document is left up to you.

An oral presentation of the final report is required. The oral presentation should be no longer than 15 minutes and should be professional using Power Point. An XGA projector and notebook computer will be available. A prototype of your project is required at this time. If it is not practical to bring it in, then a video of the prototype is acceptable.

## COURSE OUTLINE

<u>Week</u>	<u>Topic/Activity</u>
1	<b>1<sup>st</sup> Project Meeting:</b> Introduction, Return of MET 401 Deliverables (Proposals, Log Books, Presentation Handouts)
2	Make “Design Changes” as needed. (“Change Orders” are not required during this period). - By Appointment
3	<b>Deliverable Due</b> Progress Reports due by Close-of-Business (COB) including Finalized Design and Schedule - Meeting By Appointment -
4	<b>2<sup>nd</sup> Project Meeting:</b> -“Change Orders” are required for any modifications after this meeting.
5	<b>Deliverable Due</b> Meeting Minutes due of 2 <sup>nd</sup> Project Meeting due by Close-of-Business (COB)  - Meeting By Appointment
6	- Meeting By Appointment
7	<b>Deliverable Due</b> Progress Reports due by Close-of-Business (COB) – - Meeting By Appointment
8	<b>3<sup>rd</sup> Project Meeting:</b>
9	<b>Deliverable Due</b> Meeting Minutes due of 3rd Project Meeting due by Close-of-Business (COB)  <b>Deliverable Due</b> Progress Reports due by Close-of-Business (COB)  - Meeting By Appointment
10	<b>-4<sup>th</sup> Project Meeting:</b>
11	- Meeting By Appointment
12	<b>Deliverable Due</b> Meeting Minutes due of 4th Project Meeting due by Close-of-Business (COB)  - Meeting By Appointment
13	<b>5<sup>th</sup> Project Meeting:</b> Design Project Presentations
14	<b>6<sup>th</sup> Project Meeting:</b> Design Project Presentations (Con’t) <b>All Deliverables Due</b> - Final Project Report, Project Log Book, Presentation Handout Slides