



North Central State College

MASTER SYLLABUS

2025-2026

- A. Academic Division: Engineering Technology, Business & Criminal Justice Division
- B. Discipline: Mechanical Engineering Technology
- C. Course Number and Title: MECT3050 Mechanical Design I
- D. Assistant Dean: Brooke Miller, M.B.A.
- E. Credit Hours: 3
- F. Prerequisites: MECT3010, MECT2440
- G. Last Course/Curriculum Revision Date: Fall 2025 Origin date: 09/26/2018
- H. Textbook(s) Title:
Shigley's Mechanical Engineering Design
 - McGraw Hill
 - Keith Nisbett and Richard Budynas
 - 2024
 - Print: 9781266731716
 - Rental: 9781265472696
 - eBook: 9781260914788
- I. Workbook(s) and/or Lab Manual:
- J. Course Description: This course introduces the student to the engineering design process. Analysis of stress, strain, deflection and fatigue in mechanical design will be examined. Design of beams, columns, springs and machine elements will also be discussed.
- K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments -- How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Determination of stresses and how to apply them to mechanical elements and systems.	Problem based quizzes and exams
2. Evaluate the design of machine elements to avoid fatigue failure.	Problem based quizzes and exams
3. Evaluate the design of machine elements to avoid failure due to stress concentrations.	Problem based quizzes and exams
4. Evaluate the relationship between mating machine elements.	Problem based quizzes and exams

ABET Outcomes:

- *Outcome e.* Manufacturing processes;
- *Outcome f.* Material science and selection;
- *Outcome g.* Solid mechanics (such as statics, dynamics, strength of materials, etc.);
- *Outcome h.* Mechanical systems design;
- *Outcome k.* Application of industry codes, specifications and standards.

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70–72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Poor
00–59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences.

Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at

<https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf>



Academic Division: Engineering Technology, Business and Criminal Justice Division

Discipline: Mechanical Engineering Technology

Course Coordinator: _____

Course Number: MECT-3050-30

Course Title: Mechanical Design I

Semester / Session: Spring 2026 / Full Semester

Start / End Date: 01/12/2026 – 05/08/2026

Instructor Information

Name: Md Saiful Islam

Credentials: Ph.D. in Geological Sciences, M.S. in Petroleum Engineering, and B.S. in Mechanical Engineering

Phone Number: 419-755-4717

E-Mail Address: sislam@ncstatecollege.edu

Office Location: Kehoe 234

Office Hours: Tuesday & Thursday: 10:00 AM - 12:30 PM

I. Topical Timeline (Subject to Change):

Weeks	Topics	Assignment	Due Date
1	Ch-1: Introduction to Mechanical Engineering Design	Quiz-1	01/27/2026
2-3	Ch-2: Material Properties	Quiz-2/Home Work	02/10/2026
4-5	Ch-3: Load and Stress Analysis		
6-7	Ch-4: Deflection and Stiffness	Quiz-3	02/24/2026
8	Contents covered in Weeks 1 to 7	Midterm Exam	03/05/2026
9	Spring Break - No Class		03/09/2026 – 03/13/2026
10-11	Ch-5: Failures Resulting from Static Loading	Quiz-4/Home Work	04/07/2026
12-13	Ch-6: Fatigue Failure Resulting from Variable Loading		
14-15	Ch-7: Shafts and Shaft Components	Quiz-5	04/21/2026
16	Review		
17	Final Exam		05/05/2026

NOTE: This is a tentative schedule. Assignments and due dates may be changed at the discretion of the instructor.

II. Grading and Testing Guidelines:

- Final Grade Calculation:

Activity	Qty	Points	Percentage
Quizzes/Home Works	5	500	30
Mid Term Exam	1	100	30
Final Exam	1	100	40

- College Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70–72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Poor
00–59	F	0.00	Failure

III. Examination Policy:

1. The reasons for which a student will be excused from taking an examination:
 - a. Hospitalization (with documented verification)
 - b. Death in the immediate family (with documented verification)
 - c. Personal illness or illness in immediate family - (doctor's excuse required).
2. A student who misses an examination for any reason is responsible for:
 - a. Notifying the instructor before the day of the examination.
 - b. Set up a new date for the examination through email from instructor.
3. No makeup opportunity will be given for absences of quizzes.

IV. Class Attendance and Homework Make-Up Policy:

Attendance is required per NCSC policy. Class Absentees: No merit or demerit derived from attendance, unless it prevents you from taking a quiz or examination. Homework value will lose 10% per day late.

V. Classroom Expectations:

1. **Questions in class:** Any questions regarding the material are welcome during the class. If something is not clear to you, it probably is not clear to others. So, ask questions. Your question not only helps yourself, but it also helps others. If your question is too specific and its answer is too long, I may invite you to ask me later in my office.
2. **Office hours:** Take the full advantage of the office hours. Any questions regarding assignments, exam reviews, or general understanding of the material are welcome. If you cannot make the scheduled office hours, appointments can be made in class or by email.
3. **Diagrams:** The importance of diagrams in this course, and generally in Mechanical Engineering, cannot be possibly over-emphasized. Their benefit is two-fold; a) Diagrams help you imagine a problem's scenario, so you will not leave out any details and your solution will be accurate, b) Diagrams are a good tool to represent your solution more clearly to your audience (here, a grader for example, and later to your manager/colleagues). Both a) and b) will enhance your performance as a student and as a future engineer.
4. **Assignments:** Doing the assignments is extremely important. As you will see, the concepts of Mechanical Design are very simple. Applying them to different problems, however, is challenging at least. You can master the application techniques only by practicing. So, do not neglect the assignments. The assigned homework problems are the bare minimum number required for you to consider. You must solve as many extra problems on your own as possible for best results in this course.