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: MECT3010 Applied Dynamics

D. Assistant Dean: Brooke Miller, M.B.A.

E. Credit Hours: 3

F. Prerequisites: MATH 1151, MECT 2330

G. Last Course/Curriculum Revision Date: Fall 2025 Origin date: 09/26/2018

H. Textbook(s) Title:

Mastering Engineering with Pearson eText for Engineering Mechanics: Statics & Dynamics
- *Authors: Hibbeler*
- *Copyright Year: 2022*
- *Edition: 15th Edition*
- *ISBN: 9780134867267 – Multi-Term Access*

I. Workbook(s) and/or Lab Manual:

J. Course Description: In this course, students will study static force and moment analysis using vector method, applications of dry friction and analysis of structures and machines. Dynamic analysis using force and acceleration, energy and momentum methods 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	

North Central State College

SYLLABUS ADDENDUM

Academic Division: Business, Industry, and Technology **Discipline:** Mechanical Engineering Technology

Course Coordinator:

Course Number: MECT 3010 **Course Title:** Applied Dynamics

Semester / Session: Fall 2025 **Start / End Date:** 8/11/2025 – 12/12/2025

Instructor Information

Name: Md Saiful Islam **Credentials:** PhD, MSc, and BSc

Phone Number: 419-755-4717 **E-Mail Address:** sislam@ncstatecollege.edu

Office Location: Kehoe 234 **Office Hours:** Thursday: 12:00PM - 3:00PM and Friday 10:00AM - 12:00PM

I. Topical Timeline (Subject to Change):

Weeks	Topic	Assignment	Due Date
1-2	Ch-12: Kinematics of a Particle	Quiz-1	08/19/2025
3-4	Ch-13: Kinetics of a Particle: Force and Acceleration	Quiz-2	09/02/2025
5-6	Ch-14: Kinetics of a Particle: Work and Energy	Home Work	
7-8	Ch-15: Kinetics of a Particle: Impulse and Momentum	Quiz-3	09/16/2025
8	Contents covered in Weeks 1 to 7	Midterm Exam	09/30/2025
9	Fall Break - No Class		10/6/2025 – 10/10/2025
10-12	Ch-16: Planar Kinetics of a Rigid Body	Quiz-4	10/28/2025
13-14	Ch-17: Planar Kinetics of a Rigid Body: Force and Acceleration	Home Work	
15-16	Ch-18: Planar Kinetics of a Rigid Body: Work and Energy	Quiz-5	11/25/2025
17	Review		
18	**Final Exam**		12/09/2025
NOTE: THIS IS A TENTATIVE SCHEDULE. ASSIGNMENTS AND DUE DATES MAY BE CHANGED AT THE DISCRETION OF THE INSTRUCTOR.			

II. Course Assignments:

Homework: The homework problems will be posted on Canvas.

Quizzes will be in class. Missed quizzes will not be made up and will result in a "0" score for the quiz.

Exams: All the necessary formulas will be given. If you must miss an exam (for any legitimate reason, e.g.: illness), please notify me as early as possible. No makeup examination permitted if instructor is not notified before the day of the scheduled examination.

III. 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

IV. 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.

V. 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.

VI. 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 Dynamics 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.

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. Compute vector analysis in three dimensions.	Problem based quizzes and exams
2. Evaluate curvilinear motion of particles using rectangular, normal and tangential, and cylindrical components.	Problem based quizzes and exams
3. Analyze particle and rigid body motion through the use of force and acceleration.	Problem based quizzes and exams
4. Discuss energy and study its use in analyzing particle and rigid body motion.	Problem based quizzes and exams
5. Define impulses and discuss momentum methods to analyze particle and rigid body motion.	Problem based quizzes and exams

ABET Outcomes:

- *Outcome b.* Use of computer aided drafting and design software;
- *Outcome d.* Elements of differential and integral calculus;
- *Outcome h.* Mechanical system design.

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