



North Central State College

MASTER SYLLABUS

2026-2027

- A. Academic Division: Engineering Technology, Business & Criminal Justice Division
- B. Discipline: Mechanical Engineering Technology
- C. Course Number and Title: MECT2905 Design Project I
- D. Assistant Dean: Brooke Miller, M.B.A.
- E. Credit Hours: 1
Lecture: 0 hours
Laboratory: 3 hours
- F. Prerequisites: MECT1750, MECT2440c
- G. Last Course/Curriculum Revision Date: Fall 2026 Origin date: 09/26/2018
- H. Textbook(s) Title: None
- I. Workbook(s) and/or Lab Manual: None; Class handouts will be distributed
- J. Course Description: Students will participate in a mechanical design project to be completed following the procedures presented.
- 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. Utilize engineering software to develop a project design.	Week 3 Project Proposal, Week 8 Progress Report, Final Report
2. Utilize engineering manuals to compile relevant data and formulae.	Week 3 Project Proposal, Week 8 Progress Report, Final Report
3. Collaborate with team members in problem solving and design.	Week 3 Project Proposal, Week 8 Progress Report, Final Report
4. Effectively communicate with team members, business partners, and during final presentation.	Final Report and Presentation, Week 15

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	Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Below Average
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>



North Central State College
SYLLABUS ADDENDUM

Academic Division:	Engineering Technology, Business & Criminal Justice	Discipline:	Engineering Technology
Course Coordinator:	N/A		
Course Number:	MECT-2905-900	Course Title:	Design Project I
Semester / Session:	Fall 2026	Start / End Date:	8/17/2026 - 12/11/2026

Instructor Information

Name:	Fisher Kalb	Credentials:	BASMET
Phone Number:	N/A	E-Mail Address:	fkalb@ncstatecollege.edu
			Tuesdays: 10:00 A.M. to 10:30 A.M. and 2:10 P.M. to 5:00 P.M.
Office Location:	Room 054	Office Hours:	Wednesdays: 10:00 A.M. to 5:30 P.M.

I. Topical Timeline / Course Calendar (Subject to Change):

Week	Topics	Assignment	Due Date
1	Introduction		
	Pipe Drilling Jig Project Criteria	Pipe Drilling Jig Design Proposal	Week 3
		Pipe Drilling Jig Presentation	Week 6
		Pipe Drilling Jig Report	Week 7
2	Project Management	Pipe Drilling Jig Gantt Chart	Week 3
	Soft Skills		
		Week 2 Report	Week 3
3	Inventor Review	Pipe Drilling Jig Parts	Week 6
		Drawings for Pipe Drilling Jig Parts	
		Pipe Drilling Jig Assembly	
		Pipe Drilling Jig Assembly Drawing	
	Geometric Dimensioning and Tolerancing	Dimension Fundamentals and GD&T Quiz	Week 4
		Week 3 Report	Week 4
4	Bill of Materials	Pipe Drilling Jig Bill of Materials	Week 6
		BOM and MRP Quiz	Week 5
		Week 4 Report	Week 5
5	Measuring Tools	Measuring Tools and Tool Safety Quiz	Week 6
	Tool Safety		
		Week 5 Report	Week 6
6	Pipe Drilling Jig Presentation Week		
	Go-Cart Design Project Criteria	Go-Cart Design Proposal	Week 8
		Go-Cart Design Presentation	Week 16
		Go-Cart Design Report	Week 17
7	E-Bike Introduction and Safety		
		Week 7 Report	Week 8
8	Electric Theory and Components		
		Go-Cart Design Gantt Chart	Week 10
		Week 8 Report	Week 9
9	FALL BREAK		
10	Batteries and Battery Management Systems		
		Week 10 Report	Week 11

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Week	Topics	Assignment	Due Date
11	Electric Motors		
		Go-Cart Bill of Materials Week 11 Report	Week 16 Week 12
12	Troubleshooting		
		Week 12 Report	Week 13
13	Go-Cart Design Presentation Review		
	Go-Cart Design Report Review		
	Wire Connectors		
		Week 13 Report	Week 14
14	Go-Cart Design Presentation Review		
	Go-Cart Design Report Review		
	Data Recorders and Analyzers		
		Week 14 Report	Week 15
15	THANKSGIVING BREAK		
16	Go-Cart Design Presentation Week		
17	Go-Cart Design Presentation Week		

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Quizzes and Attendance	3	N/A	10%
Project Drawings and BOM	4	N/A	35%
Project Plans and Progress Reports	11	N/A	15%
Project Reports	2	100	20%
Project Presentations	2	24	20%

1. **Introduction**
 - a. Introduction to the course
2. **Pipe Drilling Jig Project Criteria**
 - a. Sketch/Proposal
 - b. Gantt Chart
 - c. Design
 - Modeled Parts
 - Part Drawings and Dimensions
 - Modeled Assembly
 - Assembly Drawing
 - Bill of Materials
 - d. Weekly Reports
 - e. Project Report
 - Title Page
 - Table of Contents
 - Objectives
 - Introduction
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusion
 - References

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- f. Project Presentation
 - Title Slide
 - Objectives
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusions
 - Reference
3. **Project Management**
 - a. Describes Project Management
 - b. Describes Gantt Chart
4. **Soft Skills**
 - a. Describes the Methods to Effectively Communicate with Team Members, Business Partners, and Others
5. **Inventor Review**
 - a. Reviews the Functions of Inventor Software
6. **Geometric Dimensioning and Tolerancing**
 - a. Describes the Principals of Geometric Dimensioning and Tolerancing
7. **Bill of Materials**
 - a. Describes Single and Multi-Layer Bills of Materials
8. **Measuring Tools**
 - a. Describes the Way to Read Calipers and Other Measuring Tools
9. **Tool Safety**
 - a. Describes Proper Usage and Personal Protective Equipment of Several Tools
10. **Pipe Drilling Jig Presentation Week**
 - a. Students Present the Pipe Drilling Jig Project
11. **Go-Cart Design Project Criteria**
 - a. Sketch/Proposal
 - b. Gantt Chart
 - c. Design
 - Modeled Parts
 - Part Drawings and Dimensions
 - Modeled Assembly
 - Assembly Drawing
 - Bill of Materials
 - Finite Element Analysis
 - d. Weekly Reports
 - e. Construction
 - f. Mousetrap Car Event
 - g. Project Report
 - Title Page
 - Table of Contents
 - Objectives
 - Introduction
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusion

- References
- h. Project Presentation
 - Title Slide
 - Objectives
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusions
 - Reference
- 12. **E-Bike Introduction and Safety**
 - a. Describes an E-Bike and the precautions to take while working with one
- 13. **Electric Theory and Components**
 - a. Describes the equations behind power, resistance, voltage, and amperage as well as the function of electrical components
- 14. **Batteries and Battery Management Systems**
 - a. Describes the types of batteries and the function of a Battery Management System
- 15. **Electric Motors**
 - a. Describes the different types of electric motors
- 16. **Troubleshooting**
 - a. Describes issues with electric vehicles and methods of resolving them
- 17. **Go-Cart Design Presentation Review**
 - a. Reiterates the criteria of the Go-Cart Design Project Presentation
 - Title Slide
 - Objectives
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusions
 - Reference
- 18. **Go-Cart Design Report Review**
 - a. Reiterates the criteria of the Go-Cart Design Report
 - Title Page
 - Table of Contents
 - Objectives
 - Introduction
 - Design Methodology
 - Test and Evaluation
 - Analysis of Results
 - Conclusion
 - References
- 19. **Wire Connectors**
 - a. Describes the types of wire connections and connectors
- 20. **Data Recorders and Analyzers**
 - a. Describes the functions of data recorders and analyzers
- 21. **Go-Cart Design Presentation Week**
 - a. Students Present the Go-Cart Design Project
- 22. **Go-Cart Design Presentation Week**
 - a. Remaining Students Present the Go-Cart Design Project

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).

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2. A student who misses an examination for any reason is responsible for _____
 - a. Contacting the instructor prior to the exam time
 - b. Working with instructor on how and when the exam will be made-up.
3. No makeup opportunity will be given for absences of unscheduled quizzes.

IV. Class Attendance and Homework Make-Up Policy:

1. Class attendance is necessary to acquire the knowledge required to _____
 - a. Complete weekly assignments
2. Students are responsible for _____
 - a. Attending and participating in their classes.
 - b. All assignments issued

V. Classroom Expectations:

As a NC State Student, be it online or hybrid, your conduct in this course is subject to [the NC State Student Code of Conduct. \(Links to an external site.\)](#)

As a future professional in your field, **you will be expected to conduct yourself as a professional in this course in ALL work and communications** - be it assignments, discussion forums, Canvas Inbox, emails etc.

This includes but is not limited to:

- **Being respectful of classmates' opinions, work and comments**
Good test = Is this something I would/should say to a co-worker in person?
- **Being respectful in communications with the instructor**
Good test = Is this something I would/should say to my boss in the workplace?
- **Being respectful of diversity**
Good test = Is this a comment/joke that is at some other groups, ethnicity, political etc. expense?
Note: Offensive "jokes", slurs or hate speech (Links to an external site.) will NOT be tolerated
- **Using Non-Profane, Appropriate Language**
Good test = Is this language you would use in the workplace or in front of your grandmother?
- **Using proper. NON-"Text speak" Language to make Yourself Easily Understood**
Good test = Could my older boss understand what I have written?

Failure to conduct yourself as a professional and meet standards above in this course will result in the following consequences in this course:

- **1st Instance** = Written warning from the instructor documenting issue
(No points deductions)
- **2nd offense** = **Mandatory** meeting with the instructor and or Department Chair or Division Dean
(Related assignment/Participation subject to Point Deductions)
- **3rd offense:** College Disciplinary procedures filed with the NC State Judicial Committee as a violation of the Student Code of Conduct.
(Course Grade subject to F)

Extreme or repeated unprofessional behavior will result in initiating college disciplinary procedures as outlined in [the NC State Student Code of Conduct. \(Links to an external site.\)](#) NCSC Disciplinary hearings can result in a variety of consequences, including and up to suspension or being expelled from the college.