COLUMBUS STATE COMMUNITY COLLEGE

ENGINEERING 1181

Course: **Fundamentals of Engineering I**
ENGR-1181-005-01373-AU-2025
M 6:00 -7:50 PM (NH 232) W 6:00 – 7:50 (TL 219)

Instructor: Dr. Muhammad Mereb, PhD (Biological & Physical Sciences Department)

Email/Office: mmereb@cscc.edu
Emails are typically answered within 48 hours, except on weekends

CSCC Syllabus Statements: https://www.cscc.edu/academics/syllabus.shtml

Textbook & Zybooks: Students will **be required to purchase Zybooks**. This is an online learning platform and not an actual book.

1. Click any zyBooks assignment link in your learning management system
(Do not go to the zyBooks website and create a new account)
2. Subscribe

The book MATLAB: An Introduction with Applications, 4th, 5th or 6th edition by Gilat, John Wiley & Sons, is **optional**. It is available digitally from www.wiley.com/go/engineeringvalue . A free ebook for MATLAB is also available for this course. See Course Information on Blackboard for the ebook.

Calculator Required: A scientific calculator will be needed for all lectures and labs. The calculator should have scientific notation, and trigonometric functions. A Texas Instruments TI 83 or higher calculator is strongly recommended for this course.

Course Description Students will be introduced to engineering fundamentals such as data analysis and report writing using Excel, MATLAB programming, and engineering concepts. A wide variety of laboratory activities will introduce the student to circuits, wind power, solar power, computer simulation, productivity, and material properties. Weekly homework assignments, labs, and lab reports teach important engineering skills. High school or introductory Physics is not a prerequisite for this course but is highly recommended.

Course Goals:
1) Students will gain an understanding of the fundamentals of engineering
2)Students will be able to conduct experiments using the scientific method.
3) Students will have be able to solve complex engineering problems using principles of engineering, science and mathematics.
4) Students will be able to analyze data using appropriate software tools like Excel and MATLAB.
5) Students will be able to work in engineering teams.
6) Students will improve their communication competence through technical writing

required in lab reports, active communication in group project work, accessing and evaluating information from a variety of sources.

These course goals are in line with the Biological and Physical Sciences Institutional Learning Goals.

Lecture: Lecture will be in NH 232. Attendance will be taken at the beginning of the class. Students who are there for attendance will receive the attendance points. Any student who misses attendance must tell the instructor before leaving class and they will receive half the attendance points.

Lab prep: Lab prep assignments will be assigned for each lab. Lab preps will be posted on Blackboard. All lab prep assignments must be completed before the start of the lab. No late lab prep assignments will be accepted.

Lab: Students must have at least 70% in the lab portion of the course to pass. A 20% score reduction will be taken for lab reports submitted up to one week late. No lab reports will be accepted later than one week after the due date. Due dates are shown in the course schedule. Lab procedures and report guidelines are on Blackboard. Attendance will be taken at the beginning of the lab. Students who are there for attendance will receive the attendance points. **Students may not be allowed to join a lab if they are more than 20 minutes late. If a student misses lab for any reason, they must communicate with their instructor. Make-up labs are at the discretion of the instructor. Students who miss the lab will not be allowed to submit a lab report and they will not receive points for that lab.**

Lab Safety:

1. Don't conduct any unapproved experiments.
2. Horseplay in the labs is dangerous.
3. Food and drink are not permitted in the lab.
4. Wear closed toe shoes. Avoid wearing dangling apparel in lab.
5. Disconnect the power supply when assembling or modifying circuits to prevent burns.
6. The Digital Multimeters (DMM) used in this lab are not suitable for use with electrical outlets. Using with outlets can cause electrocution or burns. Use the DMM only for lab sets ups. Use the DMM only to measure voltage and resistance not current.
7. All LED's must have a series resistor to prevent damaging equipment or causing burns.
8. The wind turbines and X-vanes used in lab are fragile. It is dangerous to have your face in the air stream of the wind tunnels.
9. Be careful with sharp or hot objects to prevent cuts and burns.
10. To protect the lab facilities, always have adequate protection for the tables when using sharp or hot objects.
11. Coil wires when putting away equipment,
12. Handle equipment carefully and keep the lab clean.

Application Activities: Each student must complete the application activity and submit it on Blackboard by the due date. Application activities will receive a 20% grade reduction for late work up to one week late. No application activities will be accepted later than one week past the due date.

zyBooks Activities: zyBooks subscription is required for this course. zyBooks challenge activities (CA) will be assigned on Blackboard. All CAs must be completed by the due date. CAs cannot be accepted late. The lowest CA will be dropped.

Discussion Posts: Weekly discussion posts will be posted on Blackboard. Each student must post and/or reply to a post at least two times for each post, for a total of 4 points each post. The lowest 2 grades will be dropped.

Midterms: There will be 2 midterms, each graded out of 90 pts. Midterms will happen in-class, unless students have special accommodations. All midterms must be completed on the day offered. **If a student misses a midterm for any reason, they must communicate with their instructor. Make-up tests are at the instructor's discretion and, if allowed, can be expected to be of different difficulty and may be different format than what was given to the class.**

Final Project: A final project is required in this course. The details of the project will be announced during lab.

Academic Assessment: Columbus State Community College is committed to assessment (measurement) of student achievement of academic outcomes. This process addresses what you need to learn in your program of study and if you are learning what you need to learn. The assessment program at Columbus State has four specific interrelated purposes.

1. To improve student academic achievement.
2. To improve teaching strategies.
3. To document successes and identify opportunities for improvement.
4. To provide evidence for institutional effectiveness.

Grading / Evaluation:

Total Overall Score	Course Grade
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
Below 60%	E

Assessments total pts.	1000
Application Activities 6 @ 20 pts. each	120
zyBooks Challenge Activities (CA) 9 @ 15 pts each drop the lowest CA	120
Lab Reports 8 @ 20 pts each	160
Lab Prep 8@ 5 points each	40
2 Midterms @ 90 pts each	180
Final Project	80
Final Project Presentation	10
Team survey	10
Final Exam	200
Attendance	40
Discussion Posts 12 @ 4pts, drop the lowest 2	40

After the final exam is completed, no further opportunities to improve the student's course grade are possible. Incompletes are given only to students with documented extenuating circumstances and who are in good standing in the course as of the last day to drop the course.

Course Schedule:

(Any changes to the schedule will be announced on Blackboard or during the class)

Week	Lecture	Lab
1	M 9/1 No Class – Labor day	W 9/3 - Class 1: Intro to class and team forming
2	M/9/8 Class 2: Measurements, data analysis, and problem solving Application Problem 1: Creating a problem for the DRPIE method ZyBooks CA1 assigned	W 9/10 - Lab 1: Mission Improbable: Tower **Pre-Lab 1 due**
3	M 9/15 Class 3: Intro to Excel and Graphing ZyBooks CA2 assigned **ZyBooks CA1 due** **Application Problem 1 due** **DB1 Due**	W 9/17 -Lab 2: Technical Communication **Pre-Lab 2 due** **Lab 1 report due**
4	M 9/22 Class 4: Data analysis with Excel Application Problem 2: Analyzing beam bending data **DB2 Due**	W 9/24 -Lab 3: Spot Speed **Pre-Lab 3 due** **Lab 2 report due**
5	M 9/29 Exam 1: In class **zyBooks CA2 due** **Application Problem 2 due** **DB3 Due**	W 10/1 -Lab 4: Beam Bending **Pre-Lab 4 due** **Lab 3 report due**
6	M 10/6 Class 5: Intro to MATLAB: Scripts, scalars, arrays, matrices, array indexing	W 10/8 -Lab 5: Circuits **Pre-Lab 5 due** **Lab 4 report due**

	Application Problem 3: Analyzing data in MATLAB zyBooks CA3 assigned **DB4 Due**	
7	M 10/13 Class 6: MATLAB: Relational/logical operators, conditional statements Application Problem 4: Flow diagrams zyBooks CA4 assigned **Application Problem 3 due** **DB5 Due**	W 10/15 -Lab 6: Wind Turbine **Pre-Lab 6 due** **Lab 5 report due**
8	M 10/20 Class 7: MATLAB Practice **zyBooks CA3 due** **Application Problem 4 due** **DB6 Due**	W 10/22 -Lab 7: Humanitarian Relief **Pre-Lab 7 due** **Lab 6 report due**
9	M 10/27 Class 8: MATLAB loading, analyzing, and plotting data, defining functions Application Problem 5: Loading, plotting, and analyzing experimental data zyBooks CA5 assigned **zyBooks CA4 due** **DB7 Due**	W 10/29 -Lab 8: Smart Light **Pre-Lab 8 due** **Lab 7 report due** **Team Survey 1 Due**
10	M 11/3 Class 9: For/While Loops zyBooks CA6 assigned **zyBooks CA5 due** **Application Problem 5 due** **DB8 Due**	W 11/5 -SDP Lab 1: Intro to Graphics, Debugging, and Program Development **Lab 8 report due**
11	M 11/10 Class 10: Ethics and Engineering **DB9 Due**	W 11/ 12 -SDP Lab 2: Program Development and Work Session
12	M 11/17 Exam 2: In-class zyBooks CA7 assigned	W 11/19 -SDP Lab 3: Function Development

	zyBooks CA6 due **DB10 Due**	
13	M 11/24 -SDP Work Period Application Problem 6: Creating Personas zyBooks CA8 assigned **zyBooks CA7 due** **DB11 Due**	W 11/26 -Thanksgiving – Campus closed, no class
14	M 12/ 1 -SD Work Period and Final Presentation Practice zyBooks CA9 assigned **zyBooks CA8 due** **Application Problem 6 due** **DB12 Due**	W 12/3 -SDP Lab 4: Introducing the Final Testing Protocols **Team Survey 2 Due**
15	M 12/8 MATLAB Review/ Exam Study Guide **zyBooks CA9 due**	W 12/11 **SDP Final Presentations** **Final project due**
16	M 12/ 15 **Final exam at 6:00 pm**	W 12/17 No meeting

Attendance Policy: Full participation is expected of all students enrolled in this course however daily attendance is not part of the course grade. Deductions for tardy or nonparticipation in a lab will be taken as discussed above.

Religious Accommodations Syllabus Statement:
It is the College's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students.

The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.

Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the semester begins. The instructor is then responsible for scheduling an alternative time and date for the assessment, which may be before or after the original time and date of the assessment. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all assessments and course assignments are completed.

Students with concerns should refer to the grievance process within Policy 7-16, Student Religious Accommodations. Students with concerns can also contact the Executive Assistant for the Office of Academic Affairs by emailing academicaffairs@cscc.edu or 614-287-5024.

Biological and Physical Sciences Department Diversity, Equity, and Inclusion Statement:
Everyone is welcome at Columbus State Community College. The Department of Biological and Physical Sciences works to support a healthy, inclusive, and equitable learning environment for all students. Columbus State does not permit discrimination or harassment of anyone. At Columbus State, no one is allowed to treat anyone differently based on race, color, national origin, religion, military status, cognitive or physical ability, mental illness, genetic information, sex, age, sexual orientation, pregnancy, status as a parent of a young child or status as a foster parent,

culture, heritage, gender identity or gender expression. This includes any negative comments or behavior related to any of the above characteristics. The Department of Biological and Physical Sciences is committed to maintaining a supportive classroom environment free of discrimination and harassment.

School Policies:
For details regarding Columbus State's policies for Student Conduct, Inclement Weather and School Closings, Disability Accommodations, Sickness, Financial Aid Participation Reporting, Counseling, Covid Safety, and other important topics, please see www.cscc.edu/syllabus