

ECE-100 – PRINCIPLES OF ELECTRICAL & COMPUTER ENGINEERING COURSE SYLLABUS

DESCRIPTION

This is an introductory course that presents the basic principles of electrical and computer engineering. The topics include: basic circuit theory, electrical/electronic components, basic circuit laws and circuit analysis techniques; digital logic concepts, microcomputers, programming, and interfacing to digital & analog sensors and actuators. The course has a significant practical component that gives students the opportunity to apply tools for circuit design and simulation, printed circuit board (PCB) layout, and PCB soldering/assembly. Students will also work on mobile robots by interfacing sensors and developing programs for intelligent control of robots. At the end of the term students are expected to complete a comprehensive final project and write a report to demonstrate innovative application of the course material.

INSTRUCTORS

Name: Chinwe Tait, Ph.D., Asst. Professor
Office: 2-703Q AB, ECE Dept.
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PREREQUISITES

None.

CO-REQUISITES

None.

CREDITS

This course counts for 4 undergraduate ECE credit hours.

SCHEDULE

Two 120-minute lectures with integrated lab sessions per week (2-2-4).

For Winter 2023 term: Section 01 meets Mon./Thur. 1:20PM – 3:25PM in room 2-627 AB.

ATTENDANCE

To ensure that all students are participating and to avoid issues later in the course, **attendance is mandatory**. Each student is allowed one unexcused absence. If you fail to attend class on two or more occasions during the term your grade may be negatively affected and/or you may be dropped from the class. Repeated or excessive tardiness may also have a negative impact on grades. Students should make every effort to contact the instructor as soon as possible in advance of a known absence or after an unforeseen one.

COVID-19 Attendance Details:

The course will be offered in a face-to-face (F2F) format but lectures will be recorded as supplemental materials. In the event that a student must self-quarantine, they may refer to the video recordings.

TEXTBOOK

There is no required textbook; notes/slides/references will be provided via Blackboard.

ADDITIONAL LEARNING RESOURCES

1. Electrical Engineering Principles and Applications, by Allan R. Hambley, 7th edition, 2018.

MATERIALS

For simulation assignments, students will need access to a computer with Altium Designer v18.1.11 and the Arduino Integrated Development Environment (IDE) installed.

GRADING

All grades will be posted in Blackboard. The weighting and calculation of grades and the letter grade conversion for the course are outlined below:

EE Assignments/Worksheets & Labs/Demos	40%
CE Assignments/Worksheets & Labs/Demos	40%
Final Project Demonstration & Presentation	10%
Final Project Report	10%
	100%

100-93	A
92-90	A-
89-87	B+
86-83	B
82-80	B-
79-77	C+

76-73	C
72-70	C-
69-65	D+
64-60	D
59-0	F

ACADEMIC ASSISTANCE

In addition to your professors, academic assistance with class work and writing is available from the Academic Success Center (ASC), located in room 3-322 of the Academic Building or contacted at (810)-762-9775 or academicsuccess@kettering.edu.

For more information, please visit the ASC web page:

<https://my.kettering.edu/page/academic-success-center-asc>

INSTRUCTOR'S RESPONSIBILITIES

The following is a list of responsibilities that you may expect from the instructor:

- Provide lectures that reach as broad a range of learning styles as is feasible within the constraints of the amount of material that must be covered and the time available for lectures.
- Be available outside of class for explanations and answers tailored to individual students.
- Grade materials promptly to keep each student's progress on Blackboard up to date.
- Make the student aware of the learning objectives and provide assignments that both teach basic use and application of the objectives.

STUDENT'S RESPONSIBILITIES

The following describes what is expected of a student who wishes to do well in the course:

- Attend class regularly and inform the instructor in advance if you must miss a lecture.
- Spend a minimum of 2 to 3 hours externally, per hour of lecture, on course activities outside the classroom. These activities include reviewing lecture notes, completing homework exercises, reviewing the course objectives, seeking help with the instructor, etc.
- Begin working on an assignment shortly after it is released. This will enable you to better understand the following lectures and class discussions.
- Monitor your progress in the course through Blackboard.
- **Ask the instructor** if you have questions about *anything* (lecture material, homework exercises, your performance in the course, etc.). It is your responsibility to seek help from the instructor when you do not yet feel you fully understand a topic.

COURSE LEARNING OUTCOMES

Each student who receives credit for ECE-100 will have demonstrated the ability to do all tasks listed below.

1. Explain basic Electrical and Computer Engineering concepts and applications.
2. Identify and explain the use of basic electrical/electronic circuit components.
3. Apply basic electrical circuit laws to solve circuit problems.
4. Apply circuit schematic design and PCB layout tools.
5. Apply PCB assembly/soldering/testing skills to build and test circuit board.
6. Use truth table or Boolean algebra to solve digital logic circuit problems.
7. Explain the role of microcomputers in intelligent embedded system applications.
8. Write programs for a microcontroller to handle input/output operations to/from digital and analog devices.
9. Use a microcomputer, sensors, actuators, and communication systems to solve robotics problems.
10. Write a final project report.

A detailed schedule of the course topics is provided on Blackboard.