UNIVERSITY OF NEW HAMPSHIRE
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ECE401 – Perspectives in Electrical and Computer Engineering   **FALL 2020**

COURSE DESCRIPTION

An introductory course for electrical and computer engineering majors that introduces incoming students to the fundamental concepts of analysis and design. Concepts are presented through an examination of real-world problems. Students are introduced to electrical and computer engineering problem solving and design through active learning techniques in lecture and in a laboratory setting. This provides a context for the electrical engineering and computer engineering curriculum and introduces the profession and activities of electrical and computer engineering.

CREDITS: 4 credits (3 Lecture, 1 Exploratory Section).

PRE-REQUISITES AND CO-REQUISITES: NONE

COURSES FOR WHICH THIS COURSE IS A PRE OR CO-REQUISITE: NONE

TEXT: Paul Scherz and Simon Monk, "*Practical Electronics for Inventors*", 4th Edition, McGraw Hill, 2016, ISBN-13 971259587542

REFFERENCES: See material on Canvas for additional reference materials

INSTRUCTOR:

LECTURE:	Richard A. Messner, Ph.D Associate Professor, ECE Department **Office:** W223 Kingsbury Hall **Phone:** 862-1304 **Email:** rich.messner@unh.edu	**When Emailing me Include ONLY:** **ECE401** In the **SUBJECT** line

TEACHING ASSISTANTS:	**Amarta Kumari** **Room**: W214 Kingsbury Hall **Email:** ak1276@wildcats.unh.edu	**Chris Foster** **Room**: W214 Kingsbury Hall **Email:** cmf1023@wildcats.unh.edu

COURSE WEBPAGE: All supplemental course material will be located on Canvas

COURSE GOALS:

1. Introduce the student to the profession and the broad scope of electrical and computer engineering activities.

2. Provide an active learning environment where students are engaged in electrical and computer engineering practices through exploratory activities of "hands-on" laboratory experiences and open-ended discussions.

3. Initiates the development of students' basic problem solving, communication, time-management, and other professional skills.

4. Provides students a context for the electrical engineering and computer engineering curriculum.

COURSE STRUCTURE:

The course consists of three lecture/discussion meetings and an exploratory section with a maximum student cap of twelve per exploratory section. The course is taught by an instructor with visiting speakers from industry, the government, ECE department faculty, and graduate assistants. It is important that the student meet a cadre of individuals who practice different aspects of electrical and computer engineering. It is equally important that the student meet many ECE professors to initiate and possibly establish a relationship for undergraduate research.

COVID 19 SAFETY (LECTURE):

Lectures for this class will be in McConnell room 240 for all face-to-face meeting times. Some classes maybe conducted via zoom. I will inform you prior to those dates where there will be zoom meetings which are planned to be done remotely. For those classes you will not come to class but be expected to be in the zoom meeting for that class period. After November 20th, all remaining lectures and labs will be all conducted virtually via zoom.

Read the last section of this Syllabus which outlines more specific information on COVID 19 protocol for ECE401

EXPLORATORY (LAB) SECTION:

This four-credit course consists of one credit of exploratory section. Proper preparation for exploratory time cannot be stressed enough, as that preparation will ensure that the student receives the most out of the time spent in this type of setting. Exploratory sections for this course are designed to give the student experiences that will provide the necessary background and disciplinary practices required for subsequent coursework and research. Activities in these exploratory sections will emphasize discussion and frequent student-faculty and student-student interactions including attention to issues of critical thinking and methods of inquiry. Other activities include laboratory experiments that will excite the student to pursue a career in electrical and/or computer engineering or a related fields such bioengineering. A main function of these exploratory sections is to explore the concepts and topics presented in lectures and discussions through further discussions, demonstrations, and at times laboratory investigations.

COVID 19 SAFETY:

Laboratory for this class will be in Kingsbury Hall room S216 for all lab face-to-face meeting times. After November 20th the lab time will be conducted virtually via zoom.

For all "in-lab" meetings you will be sitting at stations that will be the ones assigned to you for the whole semester. **DO NOT CHANGE YOUR SEATING ASSIGNMENT!** This is important to allow for contact tracing should anyone in the lab become infected with the COVID 19 virus.

Masks and face shields will be REQUIRED to be worn when in the Laboratory and proper social distancing should be maintained as much as possible.

Read the last section of this Syllabus which outlines more specific information on COVID 19 protocol for ECE401

VISITING FACULTY AND EXTERNAL SPEAKERS

An important component of this course is to bring in speakers from both inside and outside the University. These speakers are teaching faculty, regional leaders in industry, or former students who are working in the "real world." The objective in having them present to our class is that they can provide us with a high-level perspective of the electrical and computer engineering profession and its future. For the speakers who will be presenting to our class, students may be asked to submit either their notes taken during the presentation or a one-page summary of the topics covered by the presenter. These submissions will be counted as a homework assignment, and they will be graded based upon completeness and writing quality.

GENERAL OUTCOMES

Even though the lectures, discussions, and exploratory sections provide excitement and hopefully evidence for a career in electrical and/or computer engineering, five basic mechanisms are promoted to propel the student into investigation and innovation. The five mechanisms are listed below.

1. Reasoning and critical thinking skills
2. Understanding and practice of research methods
3. Problem solving skills
4. Communications and teamwork skills
5. Ethical Judgement

COURSE POLICIES AND EXPECTATIONS

An old adage states: **"Tell me and I forget, show me and I remember, involve me and I understand."** The last part of the statement is the true meaning of inquiry-based education. To accomplish this learning process, students are expected to take responsibility for their own learning and discovery process in this course. Therefore, students shall meet the following expectations and class policies:

Academic Honesty: Academic honesty/integrity is expected in all aspects of this course. Academic dishonesty – such as cheating and plagiarism – is grounds for disciplinary action that may range from failing a specific assignment to failing the course to further University sanctions. UNH's policies governing academic honesty can be on-line at: https://www.unh.edu/student-life/academic-honesty-policy

Canvas: Announcements, course documents (handouts, syllabi, guidelines for assignments, laboratory assignments, etc.), links to additional websites and readings and preparatory material for class will be available via the Canvas portal.

Class and Attendance: Attendance is important. As such it is important to attend if you are feeling well. **DO NOT COME TO CLASS IF YOU FEEL ILL OR HAVE A FEVER!** Lectures materials will be posted online for you should you not be able to attend class

Class Assignments: Class assignments will be submitted online. Late assignments will be penalized by twenty percent per calendar day, regardless of the reason for lateness (barring extenuating circumstances). Missing work will receive a score of "0". Work must be submitted electronically on-line via canvas.

Class Atmosphere: Students are expected to behave in an appropriate and respectful fashion towards each other and the class instructor. Students will help create and maintain a learning environment in which all members of the class feel comfortable contributing and participating. Student will also be respectful of the learning environment and avoid distracting and detracting behaviors including, but not limited to: arriving late, leaving early, leaving and reentering class during discussions, having side conversations, eating or drinking noisily, and using cell phones or other personal technological devices.

Class Participation: Active participation in the classroom creates a forum for the critical appraisal and free expression of ideas while expanding the range of perspectives on a given issue. Participation also stimulates active thinking and engagement in class topics while encouraging preparation for class. Class participation is a way of improving students' ability to speak publicly, express ideas verbally and consider and engage in the debate of complex topics.

Class Preparedness: Students are expected to come to class prepared to fully and actively engage in class activities. Readings, video assignments and any additional assignments are to be completed prior to the start of class.

Communication with Instructor: Students should feel free to contact the course instructor with course-related questions or concerns. The instructor welcomes the opportunity to meet with and assist students. Such meetings will be conducted via zoom. Students needing assistance or special accommodations with any issue should contact the instructor in a timely fashion so that their needs can be addressed, and arrangements made as expediently as possible.

Disability Statement: If you are a student with a documented disability who will require accommodations in this course, you must register with Disability Services for Students for assistance in developing a plan to address your academic needs. Students who are already registered with Disability Services should meet via zoom with the instructor as early as possible to discuss their specific needs.

Group Activities: Throughout the semester, students may participate in group projects. Students are expected to make appropriate, equal contributions to group activities. Students must make themselves available for group meetings outside of class. These will typically be conducted via zoom. Students may be asked to complete a peer evaluation assessing the contributions and efforts of each group member.

Exploratory Activities: Students are expected to come to the exploratory section prepared to fully and actively engage in laboratory/exploratory activities. Students should have read, "Laboratory Safety and Standard Procedures" before the first laboratory experience and understand its content. Questions may be raised at the first laboratory meeting

Out-of-Class Activities: Students are expected to complete all out-of-class activities in a timely fashion. Students should expect to spend several hours per week doing class assignments, including, but not limited to readings, writing assignments, research and group work.

GRADING

Grades for ECE401 will be assigned according to the following percentages:
- Participation: 10%
- Homework and quizzes: 30%
- Lab Exercises: 30%
- Poster Design and Presentation   30%

CHEATING

Instances of cheating, whether it be on quizzes, homework or lab assignments will be taken very seriously. Depending upon the nature of the offense, students caught cheating may receive penalties ranging from loss of credit on an assignment to receiving a failing grade in the class.

OFFICE HOURS

The instructor(s) are available by appointment. The teaching assistant(s) will be available in their scheduled office hours and by appointment. To make an appointment, the student should contact the instructor(s) or teaching assistant(s) to work out a mutually agreeable time to meet. For the exploratory portion of the course there will be enough coverage by the instructor(s) so that questions can be answered, and basic laboratory techniques explored fully. Most meetings will be conducted via Zoom unless otherwise agreed to.

SYLLABUS:

The following is a tentative syllabus. While it will be followed as closely as reason dictates, minor changes may be necessary from time to time; such modifications will be announced in class.

1. What is engineering and how can you survive the curriculum?
    a. Supplemental materials (see the course Canvas site)

2. College survival techniques and tips
    a. Supplemental materials (see the course Canvas site)

3. Basic analog engineering 101
    a. Readings will be assigned on the course Canvas site
    b. Supplemental materials

4. Basic digital engineering 101
    a. Readings will be assigned on the course Canvas site
    b. Supplemental materials

5. A Project Based electrical engineering learning experience
    a. Readings will be assigned on the course Canvas site
    b. Supplemental materials

LABORATORY

The laboratory portion of this course consists of the following five labs:

Lab	Topic	Dates
0	Introduction to Laboratory	Aug. 31 – Sept 4
1	Computer anatomy 101: Identifying common computer components and their arrangement	Prelab: Sept 7 - Sept 11 Lab: Sept 14 - Sept 18
2	Connecting it all together: Proper soldering methods and techniques	Prelab: Sept 21 - Sept 25 Lab: Sept 28 – Oct 2
3	Using test equipment for measurement of AC and DC Voltages, currents, and power Learning about Transformers, Diodes, and Rectification/Filtering	Prelab: Oct 5 – Oct 9 Lab: Oct 12 – Oct 16
4	Construction of a simple linear DC power supply.	Prelab: Oct 19 – Oct 23 Lab: Oct 26 – Nov 6
5	Project based learning experience	Pick: Oct 26 – Oct 30 Research: Nov 2 – Nov 6 Test: Nov 9 – Nov 20

ECE401 COVID Related Information

Personal Protective Equipment (PPE) and Social Distancing:

As faculty, TAs, and course instructors, we need your help to promote the COVID response culture at UNH. We all have a responsibility during this COVID-19 pandemic to protect our own health and the health of friends and fellow community members. Violations of the COVID protocols by even a single individual can cause significant disruptions or discontinuation of in-person academic activities. Any student creating such disruptions undermines the opportunity for others to learn and engage with the UNH community, and as such, is in serious violation of the UNH Student Rights, Rules & Responsibilities.

In alignment with our commitment to the ongoing health and safety of our community during the COVID-19 pandemic, there are several changes in classroom expectations.

All students are required to wear masks in class and campus buildings unless a medical exception is made through an accommodation process. It is your responsibility to obtain a mask before coming to class. For information on proper use of masks, acceptable mask types, and other PPE and social distancing guidelines visit https://www.unh.edu/coronavirus. Students wishing to request a medical accommodation should contact the Student Accessibility Services. Failure to comply with PPE and social distancing classroom protocols is a violation of the Student Rights, Rules & Responsibilities.

If you refuse to comply, you will be asked to leave class immediately and you may also be reported to the Office of the Dean of Students and your associate dean.

1) Your instructor or TA may be wearing a face shield without a mask during instruction and only while maintaining at least a 6-foot distance from any student.
2) Prior to class, please wait outside the building, weather permitting, or in the hall or common area, observing social distancing and leaving plenty of room for the prior class to exit the room and building. Wipes are available near the room entrance. Obey entrance and egress signage and any additional faculty directions on entering or leaving the classroom.
3) Each classroom entrance is equipped with hand sanitizer and surface wipes.
   - Use hand sanitizer as you deem appropriate, but **DO NOT use hand sanitizer on any of the laboratory equipment!**
   - Use surface wipes to wipe down your personal space prior to class. **DO NOT use these wipes as hand sanitizers!** Following class dispose of the wipes in the trash on your way out of the classroom. **DO NOT leave wipes at your assigned seat or drop them on the floor!**
4) Sit only in marked seats. Classes and laboratories were restructured to minimize or eliminate contact between individuals.
5) Contact tracing is mandated by the State of New Hampshire. To facilitate effective contact tracing implementation should the need arise, there will be assigned seating in the lab.

6) UNH has developed "Wildcat Pass," a web and mobile app to help each of us keep track of the requirements for being in compliance with necessary testing, isolation and quarantine rules that will help to keep our community healthy.

- **Log into your Wildcat Pass each day.**
- **Be prepared to show your mobile device or a computer printout of your daily Wildcat Pass to the instructor or TA.**