Department of Electrical and Computer Engineering
EGN 2271 - INTRODUCTIONS TO CIRCUITS AND ELECTRONIC HARDWARE
Fall 2022

Instructor   :   Dr. Mohammad Shah Alam
Office Hours   :   by appointment
                               MWF 10:30 am -11:30 am

Office   :   EC – 3105
Phone   :   (305)348-3163
Email   :   moalam@fiu.edu

Section/Classroom/Time
                      :   RVC: Available through FIU Canvas

Catalog Description:

This is an undergraduate-level course which covers the basics of circuits and digital design. The course presents an insider's perspective on the fundamental of resistive circuits, how digital systems are designed and how they work. The course is intended to serve students with a background in the Internet of Things. Topics covered include the resistive circuits, laws governing circuits, electronic switches, logic gates, gate-level minimization, arithmetic and logic unit, and electronic memories.

This course will consist of 9 modules. Module availability is open and can be completed at the student's individual pace. All work will be done individually. Unless otherwise noted, all assignments and assessments are required. Communication will take place primarily via the official email and professor announcements. At the end of the course, you would have learned the key techniques required to analyze practical networks with resistors and electronic logic gates. Students would have experienced some hands-on activities as well.

Reference Textbook:

1. **Circuits and Digital Design (required) from zyBooks**

   ZyBooks [Instructions and technical requirements](#)

   Online textbook by ZyBooks (all students enrolled in the class have access to it and will be used partially for assignments). A subscription is $77.

   To get access:
   a) Sign in or create an account at learn.zybooks.com
   b). Enter zyBook code: FIUEGN2271ShahAlamFall2022
   c) Subscribe

2. S.A. Reza Zekavat
    Electrical Engineering: Concepts and Applications (recommended)
    ISBN 10 :0132539187

Course Objectives:

Upon completing this course, students will be able to:

1. Explain basic electricity concepts, including electric charge, current, voltage, electrical power, and energy.
2. Apply concepts of electric network topology: nodes, branches, and loops to solve circuit problems.
3. Analyze circuits with ideal, independent, and controlled voltage and current sources.
4. Apply Kirchhoff's voltage and current laws to the analysis of electric circuits.
5. Determine the Thevenin or Norton equivalent of a given network that may include passive devices, dependent sources, and independent sources in combination.
6. Explain basic number representation used in today's digital system.
7. Apply conversion techniques between different base numbers.
8. Apply Boolean algebra to represent functionality of digital circuits.
9. Apply Boolean algebra and gate-level minimization techniques to simplify the digital circuits.
10. Analyze networks of combinational digital logic elements and sequential circuits; and
11. Explain basic logic elements in arithmetic unit and memory unit.

ABET Relationship of course to program outcomes:

(Select corresponding boxes below to applicable program outcomes for the course.)

☒ 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

☒ 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

☐ 3. an ability to communicate effectively with a range of audiences.

☐ 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

☐ 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

☐ 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

☒ 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Grading Scale:		the University's Code of Academic Integrity http://academic.fiu.edu/academic_misconduct.html
A	>94	"Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook."
A-	90-94	
B+	87-89	
B	83-86	
B-	80-82	
C+	77-79	
C	70-76	
D	60-69	
F	< 60	

Department Regulations Concerning Incomplete Grades
To qualify for an Incomplete, a student:
1. Must contact (e.g., phone, email, etc.) the instructor before or during missed portion of class
2. Must be passing the course prior to that part of the course that is not completed
3. Must make up the incomplete work through the instructor of the course
4. Must see the instructor. All missed work must be finished before last two weeks of the following term.

University policies: on sexual harassment, and religious holidays, and information on services for students with disabilities

http://academic.fiu.edu/
http://drc.fiu.edu

Policies:
- **Academic Misconduct:** For work submitted, it is expected that each student will submit their own original work. Any evidence of duplication, cheating or plagiarism will result at least a failing grade for the course.

- **Unexcused Absences:** Two unexcused absences are permitted during the term. More than two will result in the loss of points from your final grade. (**1 point** per absence above two, **3 points** per absence above 5).

- **Excused Absences:** Only emergency medical situations or extenuating circumstances are excused with proper documentation. After reviewing documentation, you are **required to email** a description of the excuse and absence dates as a written record to moalam@fiu.edu.

- **On Time:** As in the workplace, on time arrival and preparation are required. Two "lates" are equivalent to one absence. (Leaving class early is counted the same as tardy.)

- **Deadlines:** Work is due before midnight on the date specified. Late submissions within one week will receive up to half credit. After one-week, late work will not be accepted. Late submissions are graded after the final exam. Participation deadlines are absolute – no late completions or makeups.

- **Submissions:** This class is paperless. Submissions are made using the web form listed on the class web site (both online and in class sections). All submissions must be a) a single document, b) web accessible by anyone and readable with a browser c) accessible using a single URL reference

- **DO NOT** send assignments by email unless asked by the instructor to do so.

- Instructor reserves right to change course materials or dates as necessary.

Grading Scale: NOTE: There are *no makeup exams* offered

Course Requirements	Number of Items	Weight (%)
Participation Activities	9	18
Challenges Activities	9	18
Assignments	4	24
Exams	2	40
Total	24	100%

Weekly Schedule

This syllabus is subject to change; you are responsible for regularly monitoring Canvas Announcements, Conversations/Inbox and your FIU student email to be aware of any noted changes.

Date	Module Topics	Tasks
Week 1		• Watch course "Welcome" video • Review Module 0: Getting Started • Review Course and Syllabus • Introduce Yourself post • Practice Quiz • Academic Honesty Policy Quiz • Read Syllabus • Assignment Chapter 1 • EC-Invited Speaker-1 • Hands-on Activity 1.1
Week 2	Chapter 1	Due: 3rd September • Module 1: Basic Electricity • Module 1 - Video library • Zybook Challenge Activity -1 • Zybook Participation Activity - 1
Week 3	Chapter 2	Due: 10th September • Module 2: Resistor Networks (zybook Chapter 2.1 – 2.6) • Zybook Challenge Activity -2 • Zybook Participation Activity - 2
Week 4	Chapter 2 (Cont'd)	Due: 17th September • Module 2: Resistor Networks (zybook Chapter 2.7 – 2.11) • Zybook Challenge Activity -2.2 • Zybook Participation Activity - 2.2 • Homework-1 (HW-1)

Date	Module Topics	Tasks
Week 5	Chapter 3	Due: TBD • Discussion Forum - Module 3 (DF-3) • Homework-2 • Zybooks' Participation Activity-3.2 (PA-3.2) • Zybooks' Challenge Activity-3.2 (CA-3.2)
Week 6	Chapter 4	Due: TBD • Discussion Forum - Module 4 (DF-4) • Zybooks' Participation Activity-4 (PA-4) • Zybooks' Challenge Activity-4 (CA-4)
Week 7	Review for Midterm Exam (Chapters 1 - 4)	Due: TBD • Preparations for the Midterm Exam
Week 8	Midterm Exam Chapters 1 - 4	Due TBD • Midterm Exam TBD
Week 9	Chapter 5	Due TBD • Discussion Forum - Module 5 (DF-5) • Homework-3 • Zybooks' Challenge Activity-5.1 (CA-5.1) • Zybooks' Challenge Activity-5.2 (CA-5.2) • Zybooks' Participation Activity-5.1 (PA-5.1) • Zybooks' Participation Activity-5.2 (PA-5.2)

Date	Module Topics	Tasks
Week 10 & 11	Chapter 6	Due TBD • Discussion Forum - Module 6 (DF-6) • Homework-4 • Zybooks' Challenge Activity 6 (CA-6) • Zybooks' Participation Activity-6.1 (PA-6.1) • Zybooks' Participation Activity-6.2 (PA-6.2)
Week 12	Chapter 7	Due TBD • Discussion Forum - Module 7 (DF-7) • Zybooks' Challenge Activity-7 (CA-7) • Zybooks' Participation Activity-7 (PA-7)
Week 13 & 14	Chapter 8	Due TBD • Discussion Forum - Module 8 (DF-8) • Zybooks' Challenge Activity-8 (CA-8) • Zybooks' Participation Activity-8 (PA-8)
Week 15	Chapter 9	Due TBD • Module 9 (DF-9) • Zybooks' Challenge Activity-9 (CA-9) • Zybooks' Participation Activity-9 (PA-9) • Review for Final Exam
Week 16	Final Exam Chapters 5 - 9	Due TBD • Final Exam • Final Exam Honesty Statement