COURSE SYLLABUS

Digital Logic (EE 321)

Fall 2022

Instructor: Dr. Mohamed Morsy, Office: BASS 216, Email: mmorsy@tamut.edu

Office Hours: Tuesday: 1:00-2:00pm and Wednesday 10:30-11:30am

1. **Department, Number , Course Title, and Design**

Program	**Course Number:**	**Course Title**	**Design**
Electrical Engineering	EE 321	Digital Logic	Required course

2. **Catalog Description**

This course provides a detailed knowledge of Boolean algebra and its application in digital design. It provides an in-depth coverage of combinational logic circuit analysis and minimalization and design techniques. It also covers the basic concepts of sequential circuits including the use of state diagrams and state tables to represent the behavior of sequential circuits.

3. **Prerequisite**

Co-requisite: EE 322. Prerequisite: MATH 2413.

4. **Textbook(s) and/or other Required Material**

Tocci, Widmer & Moss - Digital Systems, 12th Edition, 12th ed., Pearson 2017,
ISBN: 9780134220130

5. **Course Learning Outcomes**

After successfully completing the course, students will be able to:

LO1.	Recognize digital codes and different number systems such as binary, octal, and hexadecimal.
LO2.	Identify different logic gates, symbols, their operation, and truth tables.
LO3.	Use Boolean algebra in representing, simplifying, analyzing, and designing digital logic circuits.
LO4.	Apply Karnaugh Maps technique to simplify digital logic circuits.
LO5.	Design and implement combinational logic circuits using basic logic gates and MSI elements such as Adders/Subtractors, MUX/DeMUX, Encoders/Decoders, etc.
LO6.	Design and implement sequential logic circuits using flip-flops, registers, counters, and combinational logic elements.
LO7.	Apply digital logic principles in the analysis, design, and implementation of digital systems.
LO8.	Recognize different types of programmable logic devices, memory, and data storage devices.
LO9.	Use software application MULTISIM for the design and simulation of digital logic circuits.
LO10.	Work independently as well as in a group on assignments, and course project.

Tentative Topics

Topics	Weeks	Contact Hours
Chapter 1: Introductory Concepts	1	3
Chapter 2: Number systems and Codes	2	3
Chapter 3: Logic Circuits	3	3
Chapter 4: Combinational Logic Circuits *POS-SOP-Algebraic Simplification-Designing Combinational Logic Circuits-Karnaugh Map-Parity Generator and Checkers-TTL and CMOS family*	4-6	9
Exam 1 & problem solving	7	3
Chapter 6: Binary Arithmetic Operation and Circuits *Binary addition and subtraction-Representation of signed numbers-Half Adders-Full adders*	8	3
Chapter 9: Functions of Combinational Logic *Decoders/Encoders/Multiplexers/Demultiplexers/Comparators/Code Converters*	9	1.5
Chapter 9: MSI logic circuits	9	1.5
Chapter 5: Flip-flops and related devices	10	3
Exam 2 & problem solving	11	3
Chapter 7: Counters and Registers	12-14	9
Chapter 12: Memory and Storage Devices & **Exam 3**	15	2
Exam 4 (TBD)		

6. **Grading Policy**

- 4 Exams @ 75%; (The *best three exams will be considered so there will be* ***no make-up*** *exams*.)
- Course Project @ 5%
- HW Assignments @ 15%
- Class Participation @ 5%

7. **Library/Media Resources Assessment:**
Students are highly encouraged to install Multisim software on their personal computers. It can be downloaded from https://www.ni.com/en-us/shop/electronic-test-instrumentation/application-software-for-electronic-test-and-instrumentation-category/what-is-multisim/multisim-education.html

Classroom Etiquette:

1. The use of cell phones or any other personal electronic devices is strictly prohibited. All cell phones and beepers and pagers must be turned off for the duration of the class.
2. No food is allowed in the classroom at any time.
3. Do not talk to your neighbor during class, except when asked to in a cooperative learning session.
4. No sleeping in class.
5. Be on time for the start of class and stay until the end.
6. Take notes and take responsibility for your learning.
7. Students will demonstrate respect for professors and fellow students.
8. Using humor to demean or disparage others is not acceptable.

Diversity, Equity, Inclusion, & Belonging Statement:
This statement is intended to show my commitment to an inclusive learning environment. I am committed to a learning environment where students from all backgrounds and perspectives are being heard, respected, and engaged. If there is any way you think I can improve inclusivity and sense of belonging in my classroom, please let me know.

Academic & Wellness Supports
Study can be stressful so please use the academic support resources below whenever you need them:

- **Success Center**

Tutoring is available online or in-person in the Success Center (UC330) either by walk-in or appointment, Office: UC 330, Phone: 903.334.6724, Email: tutors@tamut.edu, webpage: https://www.tamut.edu/academics/Student-Support/Success-Center/index.html

- **PATH Program**

The PATH Program (Personal Achievement Through Help) is a mentorship program for men of color and is designed to encourage and support students through guidance and engagement to enhance academic and personal success.
Website: https://www.tamut.edu/academics/Student-Support/PATH/index.html

- **Mental Health & Counseling Center**

Stress and mental health problems are common challenges that people face, but there are options available to help you on campus. For individual and group therapy options, please contact the Student Counseling Center in the UC 427 office or call for an appointment at 903-223-3186 (office) or 903-276-8276 (cell). For after-hours emergencies, call 911, University Police Department at 903-334-6611, or the local crisis line (AVAIL) at 1-800-832-1009. Other helpful numbers include the local mental health authority: Community HealthCare 903-831-7585, the National Suicide Prevention Lifeline at 1-800-273-8255, or the National Crisis Text Line at 741741. Please note that you do not have to be suicidal to use a crisis hotline.

Disability Accommodations: Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

Academic Integrity: Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

A&M-Texarkana Email Address: Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis.

Drop Policy: To drop this course after the census date, a student must complete a Drop/Withdrawal Request Form, located on the University Registrar's webpage or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email Registrar@tamut.edu, or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. **It is the student's responsibility to ensure that the form is completed properly before submission.** If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

Student Technical Assistance: Solutions to common problems and FAQ's for your web-enhanced and online courses can be found at Online Student Training.
If you cannot find your resolution there, you can submit a support request by contacting the IT Service Desk:

- Email: isite@tamut.edu
- Phone: 903-334-6603
- Submit a Support Request

Additional student help for Blackboard can be found at Blackboard Help for Students.