Digital Logic Design (EENG 2710) Spring-2016

Instructor: Parthasarathy (Partha) Guturu  
Faculty Office: NTDP B-235  
Phone: 940-891-6877  
Email: guturu@unt.edu  
Teaching Assistant: TBD  
Class Hours: T/Th 10:00 AM - 11:20 AM  
Class Room: UNT Discovery Park B-217  
Office Hours: Monday 3:00 PM-4:00 PM. Students unable to see me during these times may request an appointment.

Reference Book


References

1. DSCH freeware from www.microwind.org for executing a Digital Design Project

2. A power-point presentation is used to provide some information to support and supplement a student-centric problem/project-oriented learning methodology.
2. A **power-point presentation** is used to provide some information to support and supplement a student-centric problem/project-oriented learning methodology.

3. Good documentation is an essential component of a successful project. Please see the following report (in PDF) on [how to write project reports](#).

**Attendance Policy:** In view of the continuous evaluation strategy adopted by the instructor, perfect attendance is recommended for those aspiring to get good grades.

**Grading Policy:** Assignments/Quizzes/Class Tests: 50%, Project: 30%, and Final Examination: 20%. Grades A, B, C, D, and F will be assigned, respectively, depending upon whether the total tally will be greater than/equal to 90, 80-89, 70-79, 60-69, or less than 60.

**Academic Dishonesty:** *Honesty is the best policy.* Cheating will not be tolerated. Anyone found guilty of cheating on a test or assignment will be awarded an F grade for the course. Discussions of problems and assignment with your classmates is welcome and encouraged, however, sharing of solutions is not. If you need help, you should ask the instructor. Cheating includes, but is not limited to, all forms of plagiarism and misrepresentation. For your rights and responsibilities please refer to [http://www.unt.edu/csrr](http://www.unt.edu/csrr)

**Statement regarding Disabled Students:** The Faculty of Electrical Engineering including this instructor cooperates with the Office of Disability Accommodation (ODA) to make reasonable accommodations for students with certified disabilities (cf. Americans with Disabilities Act and Section 504, Rehabilitation Act). If you have not registered with ODA, we encourage you to do so immediately and present a written accommodation request along with an appropriate documentation from the Dean of Students Office [http://www.unt.edu/oda/](http://www.unt.edu/oda/), on or before the 2nd week of class.

**Final Exam Date and Time:** TBD.

**Course Outline and Delivery Plan**

<table>
<thead>
<tr>
<th>Topic No.</th>
<th>Topic</th>
<th>Time Allocated</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Digital and analog systems- an introduction, historical perspective, importance of L2L and PBL</td>
<td>1 Week</td>
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<td>2.</td>
<td>Number systems and codes</td>
<td>1 Week</td>
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<td>3.</td>
<td>Boolean Algebra, Switching functions and canonical forms</td>
<td>2 Weeks</td>
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<td>4.</td>
<td>Circuit minimization, Analysis of combinational circuits, and Timing issues</td>
<td>1.5 Weeks</td>
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<td>5.</td>
<td>Top-down Modular Design of Combinational Logic</td>
<td>1.5 Weeks</td>
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<td>6.</td>
<td>Sequential Circuit Elements- Latches and flip-flops</td>
<td>1 Week</td>
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<tr>
<td>7.</td>
<td>Modular Sequential Logic- Counters and shift registers</td>
<td>2 Weeks</td>
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<tr>
<td>8.</td>
<td>Analysis and Design of synchronous sequential circuits</td>
<td>3 Weeks</td>
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<tr>
<td>9.</td>
<td>Analysis and Design of asynchronous sequential circuits</td>
<td>1 Week</td>
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<tr>
<td>10.</td>
<td>Digital Logic Testing</td>
<td>1 Week</td>
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**Reading Requirements:** The students are required to come prepared to every class with the material discussed in the previous class.

**Course Learning Outcomes (CLOs)**

Course Learning Outcomes (CLOs), that is, the areas for student learning in this course are:

[CLO-1] Digital and Analog Systems: Basic Concepts and Historical Perspective

[CLO-2] Importance of Learning to Learn (L2L) and Project-Based Learning (PBL) in learning Digital Logic Design.
[CLO-1] Digital and Analog Systems: Basic Concepts and Historical Perspective
[CLO-2] Importance of Learning to Learn (L2L) and Project-Based Learning (PBL) in learning Digital Logic Design.
[CLO-3] Number Systems and Digital Logic Gates
[CLO-4] Boolean Algebra, Switching Functions and Canonical Forms
[CLO-5] Combinational Circuit Minimization, Analysis, and Synthesis
[CLO-6] Sequential circuits elements and sequential logic circuits
[CLO-7] Modular Sequential Logic- Counters and shift registers
[CLO-8] Minimal Design of Synchronous Sequential Circuits
[CLO-9] Analysis and Design of asynchronous sequential circuits
[CLO-10] Digital Logic Testing
[CLO-11] Project-based Learning (PBL) - Digital Project execution from requirements through design and testing
[CLO-12] Project Report Writing

**Student Outcomes (SOs) of Our BSEE Program**

Upon completion of our BSEE program, the students will be able to:

[SO-1] Apply knowledge of mathematics, engineering and science.

[SO-2] Design and conduct experiments to verify and validate the design projects developed by them, and analyze and interpret data.

[SO-3] Develop project-based learning skills through design and implementation of a system, component, or process that meets the needs within realistic constraints.

[SO-4] Function on multidisciplinary teams.

[SO-5] Identify, formulate, and solve engineering problems.

[SO-6] Have an understanding of professional and ethical responsibility.

[SO-7] Communicate effectively.

[SO-8] Achieve broad education necessary to understand the impact of electrical engineering solutions in a global and societal context.

[SO-9] Understand learning processes, concepts of learning to learn, and engage in lifelong learning.

[SO-10] Achieve knowledge of contemporary issues.

[SO-11] Use techniques, skills, and computer-based tools for conducting experiments and carrying out designs.

**ABET Outcomes**

3a- an ability to apply knowledge of mathematics, science, and engineering
3b- an ability to design and conduct experiments, as well as to analyze and interpret data
3c- an ability to design a system, component, or process to meet desired needs
3d- an ability to function on multi-disciplinary teams
3e- an ability to identify, formulate, and solve engineering problems
3d- an ability to function on multi-disciplinary teams
3e- an ability to identify, formulate, and solve engineering problems
3f- an understanding of professional and ethical responsibility
3g- an ability to communicate effectively
3h- the broad education necessary to understand the impact of engineering solutions in a global and societal context
3i- a recognition of the need for, and an ability to engage in life-long learning
3j- a knowledge of contemporary issues
3k- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

**Relationship between the Course Learning Outcomes and Student/ABET Outcomes**

The course learning outcomes map onto the program and ABET outcomes as depicted in the table below.

<table>
<thead>
<tr>
<th>CLO</th>
<th>Student Outcomes/ABET Outcomes</th>
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<tbody>
<tr>
<td></td>
<td>SO-1/3(a)</td>
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<td>1</td>
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<td>3</td>
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