Introduction to Digital Logic Lab for Transfer Students

ECE 2067

Description / Conditions

Transcript Abbreviation:
IntDigitalLogicLab

Course Description:
Laboratory-only component of ECE 2060 for transfer students. Laboratory practice with and application of the theory of combinational and clocked sequential networks.

Course Levels:
Undegraduate (1000-5000 level)

Designation:
Elective
Required

General Education Course:
(N/A)

Cross-Listings:
(N/A)

Course Detail

Credit Hours (Minimum if “Range”selected):
0.50

Max Credit Hours:
0.50
Select if Repeatable:
Off

Maximum Repeatable Credits:
(N/A)

Total Completions Allowed:
(N/A)

Allow Multiple Enrollments in Term:
No

Course Length:
14 weeks (autumn or spring)
12 weeks (summer only)

Off Campus:
Never

Campus Location:
Columbus

Instruction Modes:
In Person (75-100% campus; 0-24% online)

Prerequisites and Co-requisites:
Prereq: 2061, and CPHR 2.00 or above.

Electronically Enforced:
No

Exclusions:

Course Goals and Learning Objectives
Course Goals / Objectives:
Be competent in synthesizing networks of combinatorial, digital logic elements
Be competent to design and synthesize digital clocked sequential circuits
Be familiar with modern computer tools for digital design, verification and simulation
Be familiar with how to implement their design schematics to hardware using modern FPGAs
Be competent in working in teams for lab experiments
Be familiar with digital circuit design methods
Be competent in reporting standards
Be competent in using laboratory instruments and laboratory methodology
Exposure to methodology for critical troubleshooting skills

Check if concurrence sought:
No

Contact Hours
## Contact Hours:

<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to lab Equipment: Signal Generator and Oscilloscope, how to measure digital signals using the oscilloscope and the motivation for using digital signals</td>
</tr>
<tr>
<td>Introduction to Quartus and the DE2 Board: HDL files, basic RTL components for simulation. Quartus’s on-chip debugging tools, Signal Tap II and the In-System Memory Content Editor.</td>
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<td>Using the CODEC: Students are shown how to use the DE2’s audio CODEC chip to perform conversions between analog and digital signals.</td>
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<td>Introduction to the Synthesizer: build a synthesizer, Students also learn how to use Matlab to create memory contents for ROM look-up tables. Finally students are introduced to bit shifting as a means of scaling signed and unsigned numbers.</td>
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<td>Electronic Keyboard: Students build a circuit that takes signals from PS2 keyboard and converts them into musical tones by applying the concepts and skills they have learned in the previous 5 labs.</td>
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<td>Demo Player Feature for an Electronic Keyboard: Students add an auto play feature to the electronic keyboard that automatically plays a short tune. Emphasizes the use of sequential components, testing of large Quartus project.</td>
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<tr>
<th>Topic</th>
<th>LEC</th>
<th>REC out-of-class</th>
<th>REC in-class</th>
<th>Weekly LAB out-of-class</th>
<th>Weekly LAB in-class</th>
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| Total | 0 | 0 | 0 | 21 | 0 |

### Grading and Texts
Grading Plan:
Letter Grade

Course Components:
Lab

Grade Roster Component:
Lab

Credit by Exam (EM):
No

Grades Breakdown:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Lab Reports</td>
<td>100%</td>
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Representative Textbooks and Other Course Materials:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
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<tbody>
<tr>
<td>Fundamentals of Logic Design</td>
<td>Roth, Jr. and Kinney</td>
<td></td>
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</table>

ABET Student Learning Outcomes

ABET-CAC Criterion 3 Outcomes:
(N/A)

ABET-ETEC Criterion 3 Outcomes:
(N/A)

ABET-EAC Criterion 3 Outcomes:
(N/A)

Embedded Literacies (UG courses only)

Embedded Literacies Info:

Attachments / Additional Notes or Comments