University of Tehran
School of Electrical and Computer Engineering

<table>
<tr><td>Course:</td><td colspan="10">8101045 – Digital Logic Design Lab.</td></tr>
<tr><td rowspan="4">Course type:</td><td rowspan="2"></td><td colspan="6">EE*</td><td colspan="3">CE*</td><td rowspan="2">Credit:
…</td></tr>
<tr><td>Com</td><td>E</td><td>P</td><td>B</td><td>Con</td><td>D</td><td>SW</td><td>HW</td><td>IT</td></tr>
<tr><td>Required</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
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<tr><td>Level:</td><td colspan="10">Undergraduate ■
Graduate ☐</td></tr>
<tr><td>Co-requisite(s):</td><td colspan="10">None.</td></tr>
<tr><td>Prerequisite(s):</td><td colspan="10">Digital Logic Design (8101367)</td></tr>
<tr><td>Prerequisite by topic:</td><td colspan="10"></td></tr>
<tr><td>Textbook(s):</td><td colspan="10">[1] Software Manual (Modelsim, Quartus)
[2] Development Board’s Manual (DE1, DE2)</td></tr>
<tr><td>Coordinator:</td><td colspan="10">Dr. Zainalabedin Navabi, Professor, School of ECE</td></tr>
<tr><td>Goals:</td><td colspan="10">- Observe and understand gate delays and other physical properties, and their implications on logic circuit implementation.
- Carry design simulations, synthesis and device programming steps from problem description to complete FPGA implementation.
- Understand interfacing between external circuits & circuits implemented in an FPGA.
- Implemented the RT level design in an FPGA.
- Use external sensors and actuators with an FPGA implementation of a complete system.
- Understand implementation of a complete systems that includes an RTL component register files, short memories and bus interfaces.</td></tr>
<tr><td>Outcome:</td><td colspan="10">Upon successful completion of the course, students will be able:
1. Learning various aspects of a complete system implementation on an FPGA.
2. Learning external interfaces with an FPGA.
3. Learning various aspects of implementation of a small circuit using discrete logic structures.</td></tr>
<tr><td>Topics:</td><td colspan="10">1) Clock and periodic signal generation
2) Frequency Regulation
3) Function Generator
4) Audio Processing
5) VGA Driver Implementation and Display</td></tr>
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Computer usage:	yes
Assignments:	…. to …. homework assignments
Projects:	
Grading:	Assignments: … % Projects: … % Quizzes: … % Midterm exams: …% Final exam: … %
Further readings:	[1]
Prepared by:	Dr. Zainalabedin Navabi
Date:	1396/09/26

*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		