

<b>Dept Number</b>	<b>CS 315</b>	<b>Course Title</b>	<b>Computer Logic and Digital Design</b>							
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b> SP15	<b>Shahram Rahimi</b>							
<b>Catalog Description</b>	Introduction to switching algebra and its applications. Combinational logic and combinational circuit components. Sequential logic and sequential circuit components. Asynchronous sequential circuits.									
<b>Textbooks</b>										
<i>Logic and Computer Design Fundamentals.</i> Mano, Morris and Chales Kime. Prentice Hall, 3 <sup>rd</sup> Edition, 2003. ISBN: 9780131247116.										
<b>References</b>										
<b>Course Learning Outcomes</b>										
<ul style="list-style-type: none"> <li>• To learn the basic principles of digital system design and analysis.</li> <li>• To learn the analysis and design of combinational circuits using Boolean algebra and truth tables.</li> <li>• To learn state transition techniques for the analysis and design of sequential circuits.</li> </ul>										
<b>Assessment of the Contribution to Student Outcomes</b>										
<b>Outcome →</b>	1	2	3	4	5	6	7	8	9	10
<b>Assessed →</b>	X	X	X		X					
<b>Prerequisites by Topic</b>										
CS 215 with a grade of C or better										

**Major Topics Covered in the Course, Continued**

1. Introduction to switching algebra and its applications: fundamental postulates, switching expressions and their manipulation, De Morgan's theorems, canonical forms of switching functions, Boolean algebra, minimization of switching functions {5 classes}
2. Combinational logic: design procedure, analysis procedure, code conversion, multilevel NAND circuits, multilevel NOR circuits {8 classes}
3. Combinational circuit components: adders and sub tractors, decoders and encoders, read-only memory (ROM), programmable logic array (PLA) {8 classes}
4. Sequential logic: flip-flops, triggering of flip-flops, sequential and finite state machines, state assignment problems, design procedure, analysis procedure, races {6 classes}
5. Sequential circuit components: registers, counters, random access memory (RAM), algorithmic state machines, implementation of control, Mealy and Moore systems {8 classes}
6. Asynchronous sequential circuits: design procedure, analysis procedure, reduction of state tables, race-free state assignment, hazards {5 classes}