<table>
<thead>
<tr>
<th>Course Number</th>
<th>CS 315</th>
<th>Course Title</th>
<th>Computer Logic and Digital Design</th>
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<tbody>
<tr>
<td>Semester Hours</td>
<td>3</td>
<td>Course Coordinator</td>
<td>Bidyut Gupta</td>
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<tr>
<td>Catalog Description</td>
<td>Introduction to switching algebra and its applications. Combinational logic and combinational circuit components. Sequential logic and sequential circuit components. Asynchronous sequential circuits.</td>
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**Textbooks**

Open Educational Resources used for this course.

**References**

**Course Learning Outcomes**

- To learn the basic principles of digital system design and analysis.
- To learn the analysis and design of combinational circuits using Boolean algebra and truth tables.
- To learn state transition techniques for the analysis and design of sequential circuits.

**Assessment of the Contribution to Student Outcomes**

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<tr>
<th>Outcome</th>
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<tr>
<td>Assessed</td>
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**Prerequisites by Topic**

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 subtractors, 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}

Latest Revision: Fall 2020