



## MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

<b>Course Number</b>	CS 201
<b>Course Name</b>	MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
<b>Credit Value (Breakdown of theory and lab credits)</b>	3 Theory
<b>Catalog Course Description</b>	You will study the formal mathematical concepts of computer science, including such topics as elementary logic, induction, algorithmic processes, graph theory, and model of computation. (3, 3T+0S)
<b>Student Learning Outcomes/Objectives /Competencies of the Course</b>	<p>Basic logic:</p> <ol style="list-style-type: none"> <li>1. Apply formal methods of propositional and predicate logic.</li> <li>2. Create a truth table to determine whether a given formula in predicate logic is valid.</li> <li>3. Render a well-formed formula in predicate logic in English.</li> <li>4. Explain the importance and limitations of predicate logic.</li> </ol> <p>Discrete probability:</p> <ol style="list-style-type: none"> <li>1. Calculate probabilities of events and expectations for random variables.</li> <li>2. Differentiate between dependent and independent events.</li> <li>3. Apply the binomial theorem to independent events and Bayes' theorem to dependent events.</li> <li>4. Apply the tools of probability to create simple discrete event simulations.</li> </ol> <p>Functions, relations, and sets:</p> <ol style="list-style-type: none"> <li>1. Explain, with examples, the basic terminology of functions, relations, and sets.</li> <li>2. Perform the standard operations associated with sets, functions, and relations.</li> <li>3. Relate practical examples to the appropriate set, functions, or relation model, and interpret the associated operations and terminology in context.</li> </ol> <p>Graphs and trees:</p> <ol style="list-style-type: none"> <li>1. Illustrate, by example, the basic terminology of graph theory such as (e.g., adjacency matrix, vertex, degree of a vertex, cycle, path), and some of the properties and special cases of each type of graph.</li> <li>2. Demonstrate different traversal methods for trees and graphs. Model problems in IT using graphs and trees.</li> </ol>
<b>College-Wide Student Learning Outcomes</b>	N/A