**ABET Course Syllabus – CS2148**

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| **Code** | CS2148 | **Credits** | 3 |
| **Title** | Discrete Structures | **Coordinator** | Behzad Parviz |

**Course Information**

1. **Catalog Description:** An introduction to discrete mathematics with applications to Computer Science; fundamentals of logic and set theory, counting techniques, relations, induction and recursion; graphs and trees; probability theory. Graded ABC/NC.
2. **Prerequisites**: CS2012, MATH2120
3. **Contact Hours**: Lecture 3 hours/week
4. **Required/Elective:** This course is required in the BS program.

**Textbook**

Discrete Mathematics with applications (4th Edition, Brooks/Cole)

By: Susanna S. Epp

(or)

Essentials of Discrete Mathematics, 3rd Edition

by David J. Hunter

**Course Goals**

The Student Learning Outcomes that are addressed by the course are:

* SLO1: Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.
* SLO 3: Students will have a strong foundation in the design, analysis, and application of many types of algorithms.

Other outcomes of instruction:

At the end of the course, students are able to

* Create truth tables for symbolic statements in propositional logic
* Translate English statements into symbolic logic
* Determine whether an argument is valid or not
* Solve simple problems in set theory involving basic set operations
* Use Venn diagrams to solve real world problems involving sets
* Understand the principle of counting, permutations and combinations
* Understand the basic concepts of probability theory
* Solve problems in probability theory, including conditional probability
* Understand the concept of independent events and solve problems involving independent events
* Understand the concepts of number theory, methods of proof, sequences, mathematical induction, and recursion
* Understand the concepts of functions and relations
* Understand the basic concepts of graphs and Trees

**Topics Covered**

* The Logic of Compound Statements
* The logic of Quantified Statements
* Elementary Number Theory
* Method of Proof
* Sequences
* Mathematical Induction
* Recursion
* Set Theory
* Boolean algebra
* Functions
* Relations
* Counting and subset combinations
* Probability and expected values
* Graphs and Trees
* Spanning trees and shortest paths