**ABET Course Syllabus – CS4963**

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| **Code** | CS4963 | **Credits** | 3 |
| **Title** | Computer Science Recapitulation | **Coordinator** | Zilong Ye |

**Course Information**

1. **Catalog Description:** A recapitulation of the primary concepts of Computer Science; theory, programming, algorithms and systems; preparation for the Major Field Test.
2. **Prerequisites:** MATH2550, PHYS2200; Prerequisite or Co-requisite: CS4962.
3. **Contact Hours:** 9 hours/week
4. **Required/Elective:** This course is required in the BS program.

**Textbook**

No new textbook is required.

**Course Goals**

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

* SLO 1. Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.
* SLO 2. Students will be able to demonstrate fluency in at least one programming language and acquaintance with at least three more.
* SLO 3. Students will have a strong foundation in the design, analysis, and application of many types of algorithms.
* SLO 4. Students will have a fundamental understanding of computer systems.
* SLO 8. Students will have the knowledge, skills, and attitudes for lifelong self-development.

Other outcomes of instruction:

At the end of the course, students are able to

* Understand the various skills required of a Computer Science major
* Enhance their problem solving and presentation skills as they prepare solutions to several conceptual questions and present them in class.
* Solve problems that require the formulation of an algorithm for their solution.
* Effectively communicate that will help in job interviews.

**Topics Covered**

* All core topics in the core curriculum that pertain to four broad areas (A1-Theory, A2-Programming, A2-Algorithms, and A4-Systems).
* A1 – Theory (CS2148, CS3112, CS3186, CS3337)
  + Boolean algebra
  + Set theory & Graph theory
  + Algorithm analysis
  + Grammars, Languages and Acceptors
* A2 – Programming (CS2011-2013, CS332)
  + OOP principles
  + Programming logic
  + Program debugging/tracing
  + UML
* A3 – Algorithms (CS2013, Math2148, CS3112, CS3035)
  + Recursion
  + Trees (BST, Pre-order, Post-order, In-order, Heap, BFS, DFS, MST)
  + Complexity
* A4 – Systems (CS1222, CS3220, CS4440, EE3445)
  + Database Systems
  + Hardware Systems
  + Web Systems
  + Operating Systems.
* Professional development:
  + Students prepare a resume
  + Students attend workshops and/or review videos to advance their professional skills.
  + Students are exposed to the technical interview process.