**ABET Course Syllabus – CS4112**

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| **Code** | CS4112 | **Credits** | 3 |
| **Title** | Competitive Programming | **Coordinator** | Russ Abbott |

**Course Information**

1. **Catalog Description:** Review of programming and algorithms in preparation for the ACM International Collegiate Programming Contest.
2. **Prerequisites:** CS3112.
3. **Contact Hours:** Lecture 3 hours.
4. **Required/Elective:** This course is an elective course in the BS program.

**Textbook**

*Hamlin, Steven, and Felix Hamlin, Competitive Programming 3. Lulu. 2013.*

**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.*

*SLO2. Students will be able to demonstrate fluency in at least one programming language and acquaintance with at least three more.*

*SLO4. Students will have acquired advanced knowledge and skills in one or more specialized areas of computer science.*

*SLO5. Students will have the training to analyze problems and identify and define the computing requirements appropriate to their solutions.*

*SLO6. Students will embrace lifelong learning and exhibit the knowledge, skills and attitude for adapting to new environments and technologies.*

Other outcomes of instruction. At the end of the course, students are able to

* Use a variety of solving techniques.
* Apply a wide range of graph algorithms
* Apply a wide range of combinatorial algorithms
* Apply a wide range of algorithms dealing with network and geometric issues
* Apply a range of string algorithms.
* Compete as a member of a team in the ACM annual programming contest

**Topics covered**

Topics to be selected from the following.

* Mathematical foundations
* Important data structures
* Dynamic programming and other problem solving techniques
* Graph algorithms
* Combinatorial games
* Shortest path algorithms
* Network flow problems
* Computational geometry
* String algorithms
* Contest strategies.