**ABET Course Syllabus – CS2012**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | CS2012 | **Credits** | 3 |
| **Title** | Introduction to Programming II | **Coordinator** | Yuqing Zhu |

**Course Information**

1. **Catalog Description:** Algorithm development for Object Oriented Programming; inheritance, polymorphism, recursion, GUI basics; designing, coding, and documenting programs; laboratory activities on problem analysis and software development. Graded ABC/NC.
2. **Prerequisites:** CS 2011, recommended: MATH 2110.
3. **Contact Hours:** Lecture 2 hours, Laboratory 3 hours /week
4. **Required/Elective:** This course is required in the BS program.

**Textbook**

Introduction to JAVA Programming, by: Daniel Liang, 11th Edition

JAVA How to program, by Deitel and Deitel, 8th Edition

**Course Goals**

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

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

*SLO #6. Students will have the training to design, implement, and evaluate large software systems working both individually and collaboratively.*

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

* Divide a problem into its logical set of components
* Have a good understanding of the basic programming concepts
* Create simple classes with a few methods
* Have a good understanding of how a good program design reduces coding and debugging time
* Design and code mid-level problems

**Topics covered**

* Multidimensional Arrays (review)
* Lists, C structs and .jar files
* Objects and Classes
  + Defining Classes for Objects
  + Constructing Objects Using Constructors
  + Using classes from Java Library
  + Visibility Modifiers
  + Passing Objects to Methods
* Array of Objects
* Strings and Text I/O
* Thinking in Objects
* Inheritance
* Polymorphism
* Abstract Classes, Interfaces
* Exception Handling
* Testing and JUnit
* Graphics
* Event-Driven Programming
* Creating Graphical User Interfaces
* JavaFX Part I, II and III
* Library, UML and Binary I/O
* Introduction to object-oriented programming patterns