Course Syllabus

SIE 507 Information Systems Software Engineering

Course Description
Programming for those envisioning careers focused on developing and managing information systems and databases as opposed to software design. Data structures, algorithms, and their analysis. This course is tailored for graduate students in information systems and spatial information engineering with little to no previous programming experience that have a need for practical in depth Java programming skills.
Lec. 3. Cr. 3.

Prerequisites
SIS or MSIS students, of permission of the instructor

Course texts
Walter Savitch: Java - An Introduction to Computer Science and Programming.
Robert Sedgewick: Algorithms in Java (third edition)

Powerpoint slides of lecture material will be available on a course web page.

Course Goals and Objectives
- Introduce students to central concepts of information system development
- Develop an understanding of software design processes
- Acquire essential computer programming skills

Faculty Information
Dr. Reinhard Moratz
Spatial Information Science and Engineering
333 Boardman Hall
moratz@spatial.maine.edu

Office Hours
Office hours for this course will be announced at the beginning of the semester. Alternatively, contact me by email to arrange a time to meet.

Grading, Class Policies and Course Expectations
As a graduate level course, you are expected to exhibit high quality work that demonstrates sound understanding of the concepts and their complexity. Earning an "A" represents oral and written work that is of exceptionally high quality and demonstrates superb understanding of the course material. A "B" grade represents oral and written work that is of good quality and demonstrates a sound understanding of course material. A "C" grade represents a minimally adequate completion of assignments and participation demonstrating a limited understanding of course material.
Grading criteria:
Assignments – 30%
Midterm –30%

Final Exam – 30%
Class participation 10%

Academic honesty
Academic honesty is expected. Plagiarism is unacceptable in this course and will result in a failing grade.

Students with disabilities:
If you have a disability for which you may be requesting an accommodation, please contact Ann Smith, Coordinator of Services for Students with Disabilities (Onward Building, 581-2319), as early as possible in the term.

Course topics:

Week 1
Course Introduction and overview
Part 1: Fundamental programming structures in Java
Elementary data structures

Week 2
Assignments and initializations
Operators
Strings

Week 3
Control flow
Arrays

Week 4
Part 2: Object-oriented programming
Abstract data types

Week 5
Objects and classes
Constructors

Week 6
Method parameters
Overloading
Packages

Week 7
Documentation
Inheritance
Interfaces

Week 8
Part 3: Algorithms
Recursion and trees

Week 9
Sorting methods
Principles of algorithm analysis

Week 10
Searching
Binary search trees
Balanced trees

Week 11
Hashing
B Trees

Week 12
Part 4: Software design processes
Unified Modelling Language (UML)

Week 13
Software design patterns
Creational patterns
Structural patterns

Week 14
User interface design
Usability testing

Week15
Structured development of software products
Agile software development

Lab #1 – String Manipulation

Lab #2 – 2D Shapes

Lab #3 – Stack Implementation

Lab #4 – FIFO Queues

Lab #5 – Sorting

Lab #6 - Trees