CS114 - Introduction to Programming for Engineers
2014 – 2015 Spring

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Prerequisites: CS 113

Learning Objectives:
Upon satisfactory completion, student will:
- Have an understanding of the principles and practice of object oriented analysis and desigr
- Be able to implement, compile, test, and run simple Java programs
- Be able to use simple data structures

Catalogue Information
http://catalog.bilkent.edu.tr/current/course/c11114.html
Introduction to programming with Java. Data and Expressions: character strings, variables and assignments, primitive data types, expressions, data conversion. Using classes and objects: creating objects, the String class, the Random class, the Math class, formatting output, enumerated types. Writing classes: classes and objects, anatomy of a class, encapsulation, anatomy of a method. Conditionals and loops: Boolean expressions, the "if" statement, comparing data, the switch statement, the while statement, iterators, the do statement, the "for" statement. Arrays: Array elements, declaring and using arrays, arrays of objects, command-line arguments, variable length parameter lists, two-dimensional arrays, the ArrayList class, Recursion: recursive thinking, recursive programming using recursion. Credit units: 4 ECTS Credit units: 7

Textbook:
"Java Software Solutions, 8th Ed.", by Lewis & Loftus, Pearson / Addison Wesley, 2014.

Other Textbooks:
"Introduction To Java Programming, 8th Ed.", by Liang, Pearson, 2011.
"Absolute Java, 4th Ed.", Sawitch, Addison-Wesley, 2010.

Exams:
- There will be three in-class written exams: two midterms and a final.
- These three exams will be open text-book (any version of the text book by Lewis & Loftus), one hand-written double-sided A4 page (no photocopies). Sharing will not be allowed and A4 page will be taken by the instructors after the examination.
- You will receive a 0 for any lab assignment you don't attend.
- There will be a single open-book **makeup exam** at the end of the semester for students who miss the midterms for documented medical reasons. The makeup will be a written exam and will cover all topics in the course. There will not be any makeups for the labs. **Warning: The makeup exam will be very difficult so try not to miss in-semester exams! There will not be a makeup for the final exam. The students will take the RE-TAKE EXAM.**

Lab Sessions

- Students are required to attend the weekly lab sessions and complete all assignments. Students are encouraged to bring their textbooks and lecture notes to the lab sessions. They are free to use the Unilica for reference; however, communication with other students is strictly prohibited.
- There will be teaching assistants and tutors on-hand to help as necessary.
- At the end of 4 hours (20 minutes earlier), assistants will check and grade the assignment. Students should expect to be asked to explain their solutions and make modifications to them in order to ensure that they have understood relevant concepts. A grade between 0 and 100 will be given accordingly.
- There will be 11 lab sessions where the minimum grade will be discarded at the end.

Grading

Labs:	20%
Midterm1:	25%
Midterm2:	25%
Final:	30%

IMPORTANT: To be eligible to take the final exam, the total grade of the midterms should be at least 50. Those who cannot satisfy this condition will get an FZ grade.

Detailed Outline:
1. **Introduction to Java**
   a. Simple Java output program, System.out.print / println
   b. Comments
   c. Identifiers and Reserved Words
   d. White Space and Indentation
2. **Data and Expressions**
   a. Primitive Data Types
   b. Character Strings
   c. Variables and Assignment Statements
   d. Expressions
   e. Data Conversion
   f. Interactive Programs, Scanner class.
3. **Conditionals and Loops**
   a. Boolean Expressions
   b. The if Statement
   c. Comparing Data
   d. The while Statement
   e. The do Statement
   f. The for Statement
4. **Using Classes and Objects**
   a. Creating Objects
   b. The String Class
   c. Packages
   d. The Random Class
   e. The Math Class
   f. Formatting Output
   g. File Input and Output
5. **Arrays**
   a. Array Elements
   b. Declaring and Using Arrays
   c. Arrays of Objects
   d. Variable Length Parameter Lists
   e. Two-Dimensional Arrays
   f. The ArrayList Class
6. **Sorting and Searching**
   a. Sorting Algorithms
   b. Searching Algorithms
7. **Writing Classes**
   a. Classes and Objects Revisited
   b. Anatomy of a Class
   c. Encapsulation
   d. Anatomy of a Method
   e. Constructors Revisited
8. **Object-Oriented Design**
   a. Software Developments Activities
   b. Identifying Classes and Objects
   c. Static Class Members
   d. Class Relationships
   e. Method Design
9. **Recursion**

Week	Dates	Topic	Labs	Exams
1	02/02/2015-06/02/2015	Introduction to course. Introduction to Java.	NO LAB	
2	09/02/2015-13/02/2015	Data and expressions	NO LAB	
3	16/02/2015-20/02/2015	Conditional Statements	LAB 01	
4	23/02/2015-27/02/2015	Loops	LAB 02	
5	02/03/2015-06/03/2015	Using Classes and Objects	LAB 03	
6	09/03/2015-13/03/2015	Static Methods	LAB 04	
7	16/03/2015-20/03/2015	Arrays	NO LAB	No Classes – Mon, Tues, Weds
8	23/03/2015-27/03/2015	Arrays	LAB 05	**Midterm I Date:29/03/2015 10:00**
9	30/03/2015-03/04/2015	ArrayList	LAB 06	
10	06/04/2015-10/04/2015	Sorting and Searching Algorithms	LAB 07	
11	13/04/2015-17/04/2015	Writing Classes	LAB 08	
12	20/04/2015-24/04/2015	Writing Classes	LAB 09 (sec.1,3,4,5)	**Midterm II 25/04/2015 10:00** No Classes on Thurs.
13	27/04/2015-01/05/2015	Static Class Members	LAB 09 (sec. 2)	No Classes on Fri.
14	04/05/2015-08/05/2015	Recursion	LAB 10	
15	11/05/2015-15/05/2015	Review	LAB 11	