

CS114 - Introduction to Programming for Engineers 2015 – 2016 Spring

Instructors: Lori Russell Dağ Ipek Sözen
Email: russell@bilkent.edu.tr sozen@cs.bilkent.edu.tr
Office No: EA510 EA410

Prerequisites: CS 113

Learning Objectives:

Upon satisfactory completion, student will:

- Have an understanding of the principles and practice of object oriented analysis and design
- 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 exams: two midterm exams (written), and a final (written).
- You will receive a 0 for any lab assignment you don't attend.
- There will be a single **makeup exam** following each exam for students who miss the midterm for documented medical reasons. There will not be any makeups for the labs. **Warning: The makeup exams 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.
- **NOTE:** You may *only* attend the lab session to which you are registered. There will be no makeups for labs, even in the case where the student has a medical report or special permission from the university.
- There will be 11 lab sessions where the minimum grade will be discarded at the end.

Grading

Labs:	20%
Midterm I:	25%
Midterm II:	25%
Final:	30%

IMPORTANT: To be eligible to take the final exam, the total grade of the midterm exams 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	27/01/2016-29/01/2016	Introduction to course. Introduction to Java.	NO LAB	
2	01/02/2016-05/02/2016	Data and expressions	NO LAB	
3	08/02/2016-12/02/2016	Conditional Statements	NO LAB	
4	15/02/2016-19/02/2016	Loops	LAB 01	
5	22/02/2016-26/02/2016	Using Classes and Objects	LAB 02	
6	29/02/2016-04/03/2016	Static Methods	LAB 03	
7	07/03/2016-11/03/2016	Arrays	LAB 04	
8	14/03/2016-18/03/2016	Arrays	LAB 05	Midterm I Date:19/03/2016 10:00
9	21/03/2016-25/03/2016	ArrayList	LAB 06	
10	28/03/2016-01/04/2016	Sorting and Searching Algorithms	LAB 07	
11	04/04/2016-08/04/2016	Writing Classes	LAB 08	
12	11/04/2016-15/04/2016	Writing Classes	LAB 09	
13	11/04/2016-15/04/2016	Static Class Members	LAB 10	Midterm II 16/04/2016 10:00
14	18/04/2016-22/04/2016	Recursion	LAB 11	
15	26/04/2016-29/04/2016	Review	NO LAB	
16	02/05/2016-03/05/2016	Review	NO LAB	