

COURSE DESCRIPTION

Department and Course Number	CS 201	Course Coordinator	Behzad Parviz
Course Title	Introduction to Programming	Total Credits	5

Current Catalog Description:

Algorithm development for structured programming and computer programming; designing, coding, debugging, and documenting programs. Laboratory activities on problem analysis and software development.

Textbook:

Deitel and Deitel., *Java How to Program, Sixth Edition*, Prentice Hall, 2004.

Deitel and Deitel., *Java in the Lab, Sixth Edition*, Prentice Hall, 2004.

References:

Liang, Daniel., *Introduction to Java Programming, 4th Edition*, Prentice Hall, 2002.

Course Goals:

At the end of the course, students

- Understand the basic programming concepts.
- Are able to create simple classes with a few methods.
- Are able to divide a problem into its logical components.
- Understand how good program design reduces coding and debugging time.
- Are able to design and code mid-level problems.

These course goals contribute to the success of **Student Learning Outcomes 1.a, 1.d, 1.e, 5, and 6.**

Prerequisites by Topic:

Algebra and Trigonometry.

Major Topics Covered in the Course:

- Introduction to Computers and the Internet
 - What is a Computer
 - Computer Organization
 - History of Java
 - The Internet and the World Wide Web
 - Basics of a typical Java Environment

- Introduction to Java applications
 - Studying a Simple Program in Java
 - Displaying Text in a Dialog Box
 - Memory Concepts
 - Arithmetic
 - Decision Making: Equality and Relational Operators
 - Programming Design

- Introduction to Classes and Objects
 - Classes, Objects, Methods and instance variables
 - Declaring a Class with a method and Instantiating an Object of a Class
 - Declaring a Method with a Parameter
 - Primitive Types vs. Reference Types
 - Initializing Objects with Constructors

- Control Statements
 - Algorithms
 - Pseudo-code
 - if...else* Selection Statement
 - while* Repetition Statement
 - Formulating Algorithms
 - Compound Assignment Operators
 - Primitive Types
 - for* Repetition Statement
 - do...while* Repetition Statement
 - switch* Multiple-Selection Statement
 - break* and *continue* Statements
 - Logical Operators

- Methods
 - Program Modules in Java
 - static* Methods, *static* Fields
 - Declaring and using Methods with Multiple Parameters
 - Argument Promotion and Casting
 - Java API Packages
 - Scope of Declarations
 - Method Overloading

- Arrays
 - Declaring and Creating Arrays
 - Examples Using Arrays
 - Passing Arrays to Methods
 - Multidimensional Arrays
 - Variable-Length Argument Lists

Laboratory Projects (specify number of weeks on each):

Each week students complete a 3-hour lab project on a selected. In addition, they design and develop three to five large projects covering the materials taught in the course.

- Week 1: Program development using basic programming concepts and constructs.
- Week 2: Program design and Programming applications in Java using Jbuilder and JDK tools.
- Week 3: Problem development process using pseudo-code.
- Week 4: Program development using classes, and objects.
- Week 5: Program development using simple control statements for decision making and repetition: *if...else* and *while* statements.
- Week 6: Program development using control statements: *for*, *do...while*, *switch*, *break*, and *continue* statements.
- Week 7: A deeper look inside objects. Program development using class-library methods and user defined methods.
- Week 8: Program development emphasizing modularity.
- Week 9: Program development using array of items of the same types.
- Week 10: Project design and development using the main topics covered in the course.

Estimate Curriculum Category Content (Quarter Hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms	.75		Data Structures	1.5	
Software Design	.75		Prog. Languages	2.0	
Comp. Arch.					

Oral and Written Communications:

Written documentation of software built in labs and homework assignments.

Social and Ethical Issues:

No significant component.

Theoretical Content:

Logic design and algorithm development.

Problem Analysis:

In this course, students learn the basic concepts of the Java programming language. They learn algorithm development for structured programming, designing, coding, debugging, and documenting programs.

Solution Design:

Solution design in this course mostly involves generating pseudo-code for program development. Students also learn how good program design reduces coding and debugging time.