**NEW YORK CITY COLLEGE OF TECHNOLOGY/CUNY**

**Computer Systems Technology Department**

**CST1201 – Programming Fundamentals**

**(2 class hours, 2 lab hours and 3 credits)**

**Instructor: Sam Shahidullah Online**

**Email: sshahidullah@citytech.cuny.edu**

**Office hours: Mo 2pm-3pm We 2pm-3pm**

**Course Description:**

This course is an intensive introduction to computer programming using the Java language. Through lectures and lab assignments, students will learn the fundamentals of the Java programming language including control structures and user-defined methods. Concepts of object-oriented-programming will be demonstrated through the introduction of class objects and constructors. Some Java libraries will be introduced in developing application projects, such as, string manipulation classes and wrapper classes. Emphasis in the course will be placed on the development, implementation, and execution of projects with an eye to industry standards.

**Course Objectives:**

Upon successful completion of the course, the student should be able to:

1. Install and run the Java runtime environment
2. Develop, compile, and run Java applications
3. Master control structures in developing applications in the Java programming language
4. Use user-defined methods to implement modular programming techniques
5. Create interactive programs to process data and to create acceptable output
6. Develop programs using data arrays and structures
7. Demonstrate understanding of Object Oriented Programming concepts, including data fields, methods and constructors.
8. Create basic GUI applications
9. Utilize String classes to process text and
10. Understand how to use numeric wrapper classes

Prerequisites:

CST1100 Introduction to Computer Systems and CST1101 Problem Solving with Computer Programming with grade of C or better.

**Required Materials:**

Textbook: Tony Gaddis, Starting Out With Java, Fourth Edition, Addison-Wesley, 2010.

Students are required to have a USB storage device for class projects.

**Attendance Policy:**

Attendance – Attendance is expected at every class meeting. College policy sets the maximum number of permissible absences at 10% of the number of class meetings scheduled for the semester. If the class is meeting two times per week, you are permitted to be absent a total of three class sessions; if the class meets only once per week, you are permitted to miss one and one-half of the class meetings.

**Academic Integrity Policy:**

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

**Grading Procedure:**

Midterm Exam 30% Final Exam 35%

Tests 20%

Assignments 10%

Class Work 5%

=====

TOTAL 100%

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Letter Grade** | A | A- | B+ | B | B- | C+ | C | D | F |
| **Numerical Grade** | 93-100 | 90-92.9 | 87-89.9 | 83-86.9 | 80-82.9 | 77-79.9 | 70-76.9 | 60-69.9 | <=59.9 |

**Course Outline:**

|  |  |  |
| --- | --- | --- |
| Week | Topics | Reading |
| 1 | Introduction to Java Programming  Introduction to the Java development environment – NetBeans  Java fundamentals   * Print and println methods * Data types * Operators * Data conversion | Chapter 1  Chapter 2.1 – 2.8 |
| 2 | String class  Dialog Boxes | Chapter 2.9 – 2.15 |
| 3 | Decision Structures   * if-else –if statements * relational operators and logical operators   nested –if structure | Chapter 3.1 – 3. |
| 4 | Decision Structure   * switch statement * class DecimalFormat | Chapter 3.9 – 3.12 |
| 5 | Repetition Structure   * while, do-while and for loop | Chapter 4.1 – 4.5 |
| 6 | Repetition Structure  - nested loop   * - Random class | Chapter 4.6 – 4. 12 |
| 7 | Methods   * passing arguments to a method   returning a value from a method | Chapter 5.1 – 5.6 |
| 8 | Review and Midterm Exam |  |
| 9 | Introduction to classes   * Classes and Objects * Instance fields and methods * constructors | Chapter 6.1 – 6.4 |
| 10 | * GUI applications | Chapter 7 |
| 11 | Array and ArrayList   * processing array elements * passing array as arguments to method | Chapter 8.1 – 8.5 |
| 12 | Array and ArrayList   * returning array from methods * string array * array of objects * the sequential search algorithm | Chapter 8.6 – 8.8 |
| 13 | Text Processing   * Introduction to wrapper classes * Character class * More String methods | Chapter 10.1 – 10.3 |
| 14 | Text processing and Wrapper classes for Numeric data Types   * StringBuilder class * StringTokenizer * Wrapper class for numeric data types | Chapter 10.4 – 10. 8 |
| 15 | Review and Final Exam |  |

**Assessment criteria:**

|  |  |
| --- | --- |
| **For the successful completion of this course a student should be able to:** | **Evaluation methods and criteria** |
| 1. Demonstrate understanding of a Java program, and the Java development environment. | 1. Students will edit, compile, execute and get hard copy of a simple program. |
| 2. Demonstrate understanding of arithmetic operators, logical operators, and relation operators. | 2. Students will write a program using the Java arithmetic operators, input/output methods and appropriate manipulators for formatting. |
| 3. Use if and switch selection structure. | 3. Students will write program using appropriate selection statements. |
| 4. Use control structures to execute statements in a program repeatedly. | 4. Students will write a program using appropriate looping statements. |
| 5. Create new functions and understand how to write functions. | 5. Students will write a program using functions. |
| 6. Demonstrate understanding on how to use arrays. | 6. Students will use both one dimensional and multi-dimensional arrays. Students will describe different sorting and searching algorithms. |
| 7. Demonstrate understanding on how to manipulate strings. | 7. Students will develop applications that involve string manipulation using Java classes. |
| 8. Demonstrate understanding on how to use the object-oriented principle of inheritance. | 7. Students will write programs using inheritance-public, protected, and private access specifiers. |
| 9. Demonstrate understanding of how to use array in program. | 8. Students will perform an assignment that requires creation and manipulation of array of data. |
| 10. Demonstrate understanding of wrapper class. | 9 Student will complete a project that uses wrapper classes. |