**New York City College of Technology/CUNY**

**Department of Computer Systems Technology**

# CST1101–PROBLEM SOLVING WITH COMPUTER PROGRAMMING

4 hours – 3 credits

INSTRUCTOR:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ OFFICE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EMAIL: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ PHONE: \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

OFFICE HOURS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Course Description:**

This course introduces the student to concepts of problem solving using constructs of logic inherent in computer programming languages. The student studies the nature of problems, common solution approaches and analysis techniques.

This base of problem solving skill is augmented by high level computer tools. These tools enable students to construct solutions to common algorithmic problems. The course concludes with the students utilizing flowcharts to diagram problem solutions. Computer programming code is introduced to the student via the code generated by the flowcharting tool.

The major emphasis is on teaching the student to identify solutions to a problem and translate them into various forms, that will enable the computer to perform some of the steps in a solution of an actual problem instance. These forms include an objected oriented packages, flowcharting tool and viewing generated software code.

**Course Objectives:**

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

1. Understand the steps required in solving a problem using a computer.
2. Demonstrate broad problem-solving experiencing by referring to solutions from a problem bank covered during class
3. Create an application based upon object-oriented concepts using a code generation tool.
4. Understand and use the flowcharting techniques to solve an algorithm.
5. Read and comprehend software showing the coding paradigms of loops, decision statements, arrays and modules.

**Prerequisite –** CUNY certification in mathematics, reading and writing. General knowledge of a personal computer is needed. Students may enroll in a workshop at the Academic Learning Center, located in the Atrium.

**Required Texts** –

* *Starting out with ALICE* , Tony Gaddis, Pearson, 2nd edition, ISBN 0-321-54587-7
* *Starting out with JAVA* , Tony Gaddis, Pearson, 4th edition, ISBN 0-13-608020-0

**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 Violation –**  The instructor of the course has the authority to give a grade of **F** if the student submits the work of another person in a manner that represents his/her work, or knowingly permits one’s work to be submitted by another person without the instructor’s permission.

**Evaluation and Grading** –

Value

Quizzes (2) 10%

Assignments 25%

Midterm 25%

Final 40%

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Total 100%

**Grade System: Numerical Grade Ranges Letter Grade**

93-100 A

90-92.9 A-

87-89.9 B+

83-86.9 B

80-82.9 B-

77-79.9 C+

70-76.9 C

60-69.9 D

59.9 and below F

**Storage Media --**  You must have a USB storage media.

**COURSE OUTLINE**

**Assignments**

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| **Meeting** | **Topic to be Covered** | **Assignment** |
| 1 | Discussion of general problem solving methods. Introduction to logical step solutions | Read Lecture 1 |
| 2 | Review of functions and their use in logical solutions | Read Lecture 2 |
| 3 | Continue to discuss Lecture 2 | Assignment 1 in BlackBoard |
| 4 | Writing specific step of algorithms – English pseudocode – decision making, logical operators, IF/THEN/ELSE | Read Lecture 3 |
| 5 | Using repetition, with WHILE loops and FOR/NEXT loops | Read Lecture 4 |
| 6 | Continue to discuss Lecture 4 | QUIZ 1, Assignment 2 in BlackBoard |
| 7 | Storing information in lists, tables and arrays. | Read Lecture 5 |
| 8 | Combining techniques to solve real problems. Identifying appropriate techniques | Read Lecture 6 |
| 9 | Introduction to Flowcharting (RAPTOR) | Objectives, Basic Symbols |
| 10 | Flowcharting Continued | Assignment 3 in BlackBoard |
| 11 | Flowcharting Simulation, Variable Watching |  |
| 12 | More Flowcharting Problem Solving | Assignment 4 in BlackBoard |
| 13 | Introduction To ALICE | DownLoad environment, Review Tutorial 1 |
| 14 | Classes, Galleries, Objects, Properties | Review Tutorial 2-4  Assignment 4 Do 3 of the exercises on Pages 54 and 55 |
| 15 | Methods and Parameters | Read Chapter 2.1-2.5 and Chapter 5 of Alice Book |
| 16 | MIDTERM |  |
| 17 | Decisions and Loops | Read Chapter 4 of Alice Book  Project Flowchart |
| 18 | Alice Classwork | Work on Project  Assignment 6 – 3 exercies on pages 191 and 192 |
| 19 | Events | Read Chapter 6 of Alice Book |
| 20 | Alice Classwork | Work on Project |
| 21 | Alice Project Presentation | Assignment 7 Class Presentation of Project Video |
| 22 | Introduction to NetBeans/Java | Read Chapter 1 of Java Book |
| 23 | GUI Objects in NetBeans, Data types | Assignment 8 on BlackBoard |
| 24 | Java variables | Read 2.4 through 2.7 of Java Book |
| 25 | Coding Events in NetBeans | QUIZ 2 |
| 26 | Java If then Else | Read 3.1 through 3.5 of Java Book |
| 27 | Nested If then Else | Assignment 9 on BlackBoard |
| 28 | While Loop | Read Chapters 4.1-4.4 |
| 29 | Final Review | Assignment 10 on BlackBoard |
| 30 | FINAL EXAM |  |