BRONX COMMUNITY COLLEGE
o f t h e C i t y o f N e w Y o r k
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS: CSI 31 Introduction to Computer Programming I **3 credits, 4 hours**
PREREQUISITES: CSI 30 and ENG 02 and RDL 02 if required
COREQUISITE: MTH 31

TEXT: Python Programming: An Introduction to Computer Science, second edition, by John Zelle, Franklin, Beedle & Associates, 2010. ISBN 978-59028-241-9

Goals of the course:
CSI 31 introduces students to programming design and implementation. In this course students will learn basic programming style and techniques in keeping with modern programming philosophy.

Objectives: By the end of this course the successful student will be able to:
1. Identify the basic design of a computer system;
2. Describe some of the topics and techniques of computer science;
3. Design an algorithm to solve a given problem using the top-down design approach;
4. Translate that algorithm into a computer program;
5. Demonstrate understanding of the concept of data type;
6. Write functions to solve problems, and understand the notion of procedural abstraction;
7. Understand and use the three basic programming structures: sequential execution, decision structures, and repetition (loops);
8. Use files for input and output,
9. Use objects, including the objects of a graphics library, and
10. Use strings and lists to manipulate data.

Students will complete 8 to 10 programming projects selected from the list of suggested programming exercises or comparable projects developed by the instructor.

Sections and Topics	
Chapter 1 Computers and Programs (2 classes)	
1.1 The Universal Machine	1.6 The Magic of Python
1.2 Program Power	1.7 Inside a Python program
1.3 What is Computer Science?	1.8 Chaos and Computers
1.4 Hardware Basics	1.9 Chapter Summary
1.5 Programming Languages	
Suggested Review Questions 1.10 Exercises	p.21: True/False: all p.21-22: Multiple Choice: all p.22-23: Discussion: all
Suggested Programming Exercises	p. 23-25; 1, 2, 3, 4, 5
Chapter 2 **Writing Simple Programs (3 classes)**	
2.1 The Software Development Process	2.5 Assignment Statements
2.2 Example Programs	2.6 Definite Loops
2.3 Elements of Programs: Names, Expressions	2.7 Example Program: Future Value

Sections and Topics	
2.4 Output Statements	2.8 Chapter Summary
Suggested Review Questions 2.9 Exercises	p.51: True/false: all p.51-52: Multiple choice: all p. 52-53 Discussion: all
Suggested Programming Exercises	p.53-54: 1, 2, 3, 4, 5, 7, 8, 9
Chapter 3 **Computing with Numbers (2 classes)**	
3.1 Numeric Data Types	3.5 Handling Large Numbers: Long Ints
3.2 Using the Math library	3.6 Type Conversions
3.3 Accumulating Results: Factorial	3.7 Chapter Summary
3.4 The Limits of Int	
Suggested Review Questions 3.8 Exercises	p. 72-73: True/false: all p. 73-74: Multiple choice: all p. 74-75: Discussion: all
Suggested Programming Exercises	p. 76-78: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16
Chapter 4 **Objects and Graphics (2 classes)**	
4.1 Overview	4.6 Choosing Coordinates
4.2 The Object of Objects	4.7 Interactive Graphics
4.3 Simple Graphical Programming	4.8 Graphics Module Reference
4.4 Using Graphical Objects	4.9 Chapter Summary
4.5 Graphing Future Value	
Suggested Review Questions 4.10 Exercises	p. 115: True/false: all p. 115-116: Multiple choice: all p. 116-118: Discussion: all
Suggested Programming Exercises	p. 118-120: 1, 2, 3, 5, 6, 7, 8, 9, 11
Chapter 5 **Computing with Strings (3 classes)**	
5.1 The String Data Type	5.6 Lists Have Methods Too
5.2 Simple String Processing	5.7 From Encoding to Encryption
5.3 Lists as Sequences	5.8 Input/Output as String Manipulation
5.4 String Representation and Message Encoding	5.9 File Processing
5.5 String Methods	5.10 Chapter Summary
Suggested Review Questions 5.11 Exercises	p. 159: True/false: all p. 160: Multiple choice: all p. 160-161: Discussion: all
Suggested Programming Exercises	p. 162-165: 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15

Sections and Topics	
Chapter 6 **Defining Functions (2 classes)**	
6.1 The Function of Functions	6.5 Getting Results From a Function: Functions That Return Values, Functions That Modify Parameters
6.2 Functions, Informally	6.6 Functions and Program Structures
6.3 Future Value with a Function	6.7 Chapter Summary
6.4 Functions and Parameters: The Exciting Details	
Suggested Review Questions 6.8 Exercises	p. 194: True/false: all p. 194-195: Multiple choice: all p. 195-196: Discussion: all
Suggested Programming Exercises	p. 196-19: 3, 4, 5, 6, 8, 9, 11, 12, 13, 14, 15, 16
Chapter 7 **Decision Structures (2 classes)**	
7.1 Simple Decisions	7.4 Exception Handling
7.2 Two-Way Decisions	7.5 Study in Design: Max of Three
7.3 Multiway Decisions	7.6 Chapter Summary
Suggested Review Questions 7.7 Exercises	p. 227-228: True/false: all p. 228-229: Multiple choice: all p. 229-230: Discussion: all
Suggested Programming Exercises	p. 230-232: 1, 2, 3, 5, 6, 11, 12, 13, 15, 17
Chapter 8 **Loop Structures and Booleans (2 classes)**	
8.1 For Loops: a Quick Review	8.4 Computing with Booleans
8.2 Indefinite Loops	8.5 Other Common Structures: Post-Test, Loop and a Half
8.3 Common Loop Patterns: Interactive, Sentinel, File, Nested	8.6 Chapter Summary
Suggested Review Questions 8.7 Exercises	p. 260: True/false: all p. 260-261: Multiple choice: all p. 261-262: Discussion: all
Suggested Programming Exercises	p. 262-265: 1, 2, 3, 5, 7, 8, 9, 13, 14, 15
Chapter 9 **Simulation and Design (3 classes)**	
9.1 Simulating Racquetball	9.4 Bottom up implementation
9.2 Pseudo random numbers	9.5 Other design techniques
9.3 Top-down design	9.6 Chapter summary
Suggested Review Questions 9.7 Exercises	p. 291: True/false: all p. 291-292: Multiple choice: all p. 292-293: Discussion: all
Suggested Programming Exercises	p. 293-296: 1, 2, 3, 4, 5, 7, 10, 12, 13, 14

Sections and Topics	
Chapter 10 **Defining Classes (2 classes)**	
10.1 Review of Objects	10.5 Objects and Encapsulation
10.2 Example Program: Cannonball	10.6 Widgets
10.3 Defining New Classes	10.7 Chapter Summary
10.4 Data Processing with Classes	
Suggested Review Questions 10.8 Exercises	p. 331-332: True/False: all p. 332-333: Multiple choice: all p. 333-334: Discussion: all
Suggested Programming Exercises	p. 334-338: 1, 2, 3, 4, 5, 7, 9, 11, 12, 13, 14
Chapter 11 **Data Collections (3 classes)**	
11.1 Example Problem: Simple Statistics	11.6 Nonsequential Collection
11.2 Applying Lists	11.7 Chapter Summary
11.3 Lists of Records	
Suggested Review Questions 11.8 Exercises	p. 378: True/false: all p. 378-379: Multiple choice: all p. 379-380: Discussion: all
Suggested Programming Exercises	p. 380-384: 1, 2, 3, 4, 5, 6, 7, 8, 10, 13, 15, 17, 19

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