**Applied Information Technology**

**AIT 500 – Spring 2020 Course Syllabus**

****

**COURSE:** AIT 500, Fundamentals of Computer Programming and Data Structures

## DIVISION: Applied Information Technology

**CREDIT HOURS:** 6

**MEETS:** Mondays and Wednesdays, 7:30 pm to 10:10 pm, YR0221; and online

**INSTRUCTOR:** Michael Boehmer

**EMAIL:** mboehmer@towson.edu

**TEXT BOOK:**

*Java How to Program (Early Objects)*, 11th Edition, by Paul Deitel, Harvey Deitel;  
Pearson-Publisher  
ISBN-10:  0-13-474335-0

ISBN-13: 978-0-13-474335-6

**Course Description:**

Structured problem solving, algorithm development, fundamentals of computer programming, basic data structures and their implementation, sort and search algorithms, and an introduction to the design and development of information systems. Prerequisite: Admission to AIT program.

AIT 500 is a preparatory course and the credits from this course do not count towards the MS degree or certificate.

**STUDENT LEARNING OBJECTIVES AND ACADEMIC OUTCOMES:**

Upon satisfactory completion of this course, student will be able to:

1. Understand and use the concepts of structured problem solving.
2. Understand the use of abstraction in problem solving.
3. Learn to program using a high-level Object Oriented programming language.
4. Understand and use the basics of software development principles.
5. Understand and implement various data structures (Lists, Trees, etc.).
6. Utilize different sort and search algorithms.
7. Understand the concepts of Inheritance, Encapsulation, and Polymorphism.
8. Understand the role of Application Programming Interfaces (API’s).

**COURSE TIME REQUIREMENTS:**

This course will require approximately 150 hours of effort throughout the semester, divided roughly into the following categories:

* Lecture: 3 hours per week (14 weeks) = 42 hours
* Reading/Studying: 3 hours per chapter (15 chapters) = 45 hours
* Homework Exercises: 30 minutes per assignment (15 assignments) = 7.5 hours
* Programming Assignments: 4 hours per assignment (13 assignments) = 52 hours
* Final Exam: 2 hours

**COURSE POLICIES:**

Towson University students are bound by the academic policies outlined in the most current University Catalog. It is the student’s responsibility to review these policies prior to the start of each semester.

**Attendance and Participation:**

Regular and punctual attendance is required of all students. In the case of absence due to emergency (illness, death in the family, accident), religious holiday, or participation in official College functions, it is the student’s responsibility to confer with the instructor, prior to missing class, about the absence and missed course work.

**Grading Standards:**

The final course grade is comprised of the student’s mastery of course requirements. Course grades are based upon the following total mastery level:

|  |  |  |  |
| --- | --- | --- | --- |
| **Pass: 248 total points** | Homework exercises: 15 \* 5 points each  Programming assignments pseudocode: 11 \* 5 each  Programming assignments: 13 \* 10 points each | =  =  = | 75 points  55 points  130 points |
|  | Final Exam: 1 \* 50 points | = | 50 points |
|  | Total | = | 310 points |

Programs will be graded not only on whether they create the correct output, but whether they apply course concepts (as specified for each assignment), exhibit good programming style and practices, and follow the class format requirements.

**Class Preparation:**

All of the reading assignments must be completed before the class in which the material is to be discussed. Additional handouts will be distributed regarding program assignments at the appropriate time.

**Student Behavior:**

Students will be familiar with and adhere to the policies and sanctions governing student conduct as written in the Towson University Catalog. Students must arrive on time for class, participate in class activities, and exhibit courteous behavior towards all other persons.

**Computer Ethics:**

Each student is responsible for knowing the college’s policy relating to ethical behavior regarding all intellectual property and in using the computer. Copying or using another’s work, including computer files, is both illegal and unethical. See the Student Handbook.

**ACADEMIC DISHONESTY:**

Students will be familiar with and adhere to the policy governing academic dishonesty and its sanctions as written in the Towson University Catalog. Students who commit acts of academic dishonesty (e.g., cheating, fabrication, facilitating academic dishonesty, and plagiarism) will be subject to formal disciplinary action and will receive a grade of F on the test, quiz, or assignment involved and, at the discretion of the instructor; the student may receive an F for the course. This includes incidents that occur in the Test and Assessment Center.  In addition, the student will be referred to the Associate Vice President for Student Development for a Student Code Violation.

**STUDENT RESPONSIBILITIES:**

Students are responsible for completing all reading and programming assignments by the scheduled due dates. To pass this course, students must complete all assignments. Students are responsible for recognizing and accepting that when they put their name on any piece of work they are taking a vow that the work is theirs alone. Academic dishonesty of any form is unacceptable.

**Due Dates:**

To receive full credit, all assignments must be handed in by the stated due date. No late assignments will be accepted and a grade of zero (0) will be given.

**Make-Up Policy:**

*Final Exams*: There will be no make-up for the final exams except through arrangement with the instructor prior to the exam (and then only for reasons deemed valid enough to require the making-up of a new exam, which may be more difficult).

**Inclement Weather:**

If any classes have to be canceled, assignments will be rescheduled for the next class period and assignments will be collected during the next class period.

**Syllabus Modification:**

The instructor reserves the right to modify and/or change the course syllabus with reasonable notification to students.

**BIBLIOGRAPHY:**

Blackboard – https://blackboard.towson.edu

Text Book Resources – http://www.deitel.com/books/jhtp11

Java 8 API – http://docs.oracle.com/javase/8/docs/api/

**Topics to Be Presented** – *May Be Subject to Minor Changes*

| **Week** | **Topics Presented** | **Reading** |
| --- | --- | --- |
| **Introduction**   * **Learn to program using high-level Object-Oriented programming language.** * **Understand the role of Application Programming Interfaces (APIs).** | | |
| Jan 27 | Introduction to Computers and Java  Introduction to Java Applications | Chapter 1  Chapter 2 |
| Feb 3 | Introduction to Classes , Objects, Methods and Strings | Chapter 3 |
| **Programming Fundamentals**   * **Understand and use the concepts of structured problem solving.** * **Understand the use of abstraction in problem solving.** * **Understand and use the basics of software development principles.** | | |
| Feb 10 | Control Statements: Part 1 | Chapter 4 |
| Feb 17 | Control Statements: Part 2 | Chapter 5 |
| Feb 24 | Methods: A Deeper Lock | Chapter 6 |
| Mar 2 | Arrays and ArrayList | Chapter 7 |
| Mar 9 | Strings, Characters and Regular Expressions | Chapter 14 |
| Mar 16 | **No class Monday and Wednesday** |  |
| **Object-Oriented Programming**   * **Learn to program using high-level Object-Oriented programming language.** * **Understand the concepts of Inheritance, Encapsulation, and Polymorphism.** | | |
| Mar 23 | Classes and Objects: A Deeper Look | Chapter 8 |
| Mar 30 | Object-Oriented Programming: Inheritance  Object-Oriented Programming: Polymorphism | Chapter 9  Chapter 10 |
| Apr 6 | Exception Handling: A Deeper Look | Chapter 11 |
| **Data Structures and Generic Collections**   * **Understand and implement various data structures (List, Trees, etc.).** * **Utilize different sort and search algorithms.** | | |
| Apr 13 | Generic Collections | Chapter 16 |
| Apr 20 | Recursion | Chapter 18 |
| Apr 27 | Searching, Sorting and Big O | Chapter 19 |
| May 4 | Catchup | |
| May 11 | **FINAL EXAM – *must be completed by May 18 at midnight*** | |