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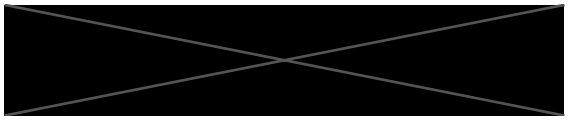
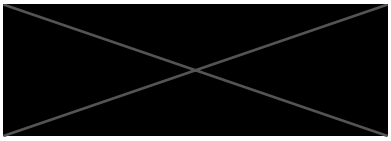
IT 1090C Computer Programming I Syllabus



Instructor



Contents

Course Description

The course introduces learners to computer programming and problem solving. In this course, students will learn about the basic elements of a computer program. Learners will learn and practice using expressions, repetition and decision-making mechanisms and structures. The concept of modularity will be introduced with the implementation of methods (functions). The Java programming language will be used for this course. Topics coverage focuses on console programming and general language syntax and carries through the use of file handling for data processing. It is designed to give general learners enough coding skills to support their day to day work. It is designed to give learners who are interested in pursuing software further a basis for Object Oriented Programming and advanced topics.

The course is dual listed for graduate credit as IT 6090C Java Programming.

Credit Hours and Course Format

3 credit hours; on-campus / in-person

Course Learning Outcomes

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

1. Demonstrate the basic processes involved in writing, compiling and running a computer program.
2. Develop accurate programming solutions for typical business tasks.
3. Explain and apply the principles of structured design to solve problems.
4. Use operators including arithmetic, relational, logical operators, assignment, etc.
5. Use various data types as well as data structures for variables in programs.
6. Use arrays, and lists for program solutions that use medium to large data sets.
7. Use sequence, decision, and iteration control structures to solve programming tasks.
8. Use methods to create reusable sub-programs to solve programming tasks.
9. Use the documentation process throughout the program life cycle.

Course Materials

All course materials are on Canopy. There is no required textbook for this course.

Required Technology

- IntelliJ IDE version 2021.3.1
- Java EE or SE JDK 8.0 or later

These are freely available for download and installation on your own machine.

- It is strongly recommended that you invest in a Flash drive and use it to store a backup of all the materials you create for the course.

Recommended Resources

- *Big Java Late Objects* 2nd ed Cay Horstmann ISBN 976-1-118-08786-6 Wiley Publishing. This is not required.
- O'Reilly Java Books: *Java Cookbook*, and *Java in the Nutshell*. You can access these online via the UC Library system using Safari.
- The UC subscription to Lynda training videos includes great Java programming videos as well as many other technical topics. There are also many similar free resources available online via YouTube.

Course Policies and Grading

Attendance/Participation Expectations

You need to read and assimilate technical information. This is a vital skill that you will need throughout your technical career as you will have to constantly learn new things. You must read and follow the directions and details for all course work. You will not succeed in the course just by attending the sessions. You will need to complete the assigned media and video presentations outside of class.

It is encouraged for you to help one another to learn, but do not supply other students with copies of your submitted work (collusion); you will receive a zero for the work if you do so.

Attendance during class sessions is required.

Communication and Feedback Policy

Generally speaking emails will be responded to within 24 hours, M-F. Students should expect that emails sent over the weekend will be responded to on Monday.

Absences

You are permitted 4 absences during the semester if the course meets 2x per week. You are permitted 2 absences during the semester if the course meets 1x per week. There is no such thing as an excused or an unexcused absence (with the exception of official University events or Military duty – those will not count toward your permitted absence total). **It is up to you to discover what you missed and to catch back up on your own. Please do not contact me to let me know you won't be in attendance or that you weren't in attendance.**

Feedback

If you are having trouble proceeding with an assignment, don't wait for class to contact the instructor. You can send screen shots of compiler errors, code fragments, attach all your assignment files, etc. via e-mail.

Assignment Submission Expectations

If you don't follow the submission directions, you work will be returned ungraded and you will receive a zero. Being able to read and follow directions is a critical job skill. You want to master this skill immediately.

Late or Missing Assignment Policy

Late work is accepted but subjected to a 10% penalty per week or partial week. **Assignments will be scored as a 0% 3 weeks past their deadline. There is no exception to this rule – I will not accept work > 3 weeks late for any reason.**

Grading Scale

93.00% and above = A
90.00%-92.99% = A-
87.00%-89.99% = B+
83.00%-86.99% = B
80.00%-82.99% = B-
77.00%-79.99% = C+
73.00%-76.99% = C
70.00%-72.99% = C-
67.00%-69.99% = D+
63.00%-66.99% = D
60.00%-62.99% = D-
less than 60.00% = F

The course grades are weighted as follows:

- Weekly Labs, Quizzes and Programming Assignments: 100%
- (Attendance issues can negatively impact your grade. See above.)

Course Schedule

For each module, there is at least one lab to complete.

Part I: Programming Logic and Methods (PLM)

Module 1 PLM Intro

Objectives:

- describe Computer components and operations (CPU, I/O, Memory)
  [You should already know this from the Fundamentals of IT course]
- describe Simple (non-branching) program logic (input, processing, output)
- begin to write Pseudocode and Flowcharts for simple non-branching programs
- use program comments

Module 2 PLM Structure, Decisions

Objectives:

- use the extended pseudo code structural elements:
  - class … end class
  - main .. return
- use conditional logic structures:
  - if .., then
  - if … then … else
  - cascaded if then else if else

    - nested if for cross products
- Given a task, break it down into a series of statements that solves it.
- Understand what variables are, how to declare and how to assign them

Module 3 PLM Iteration

Objectives:

- Explain how looping works in computer programs:
    - Types of Loops
        - definite (for loops)
        - indefinite (while loops, sentinal use)
    - Pre and Post test loops
        - Pre (for, while)
        - Post (java do while)
- Explain how looping is done by the CPU

Part II: Java Programming

Module 4 Java Intro

Objectives:

- Create an IntelliJ Java App Project with a single main class.
- Execute java programs in IntelliJ
- Declare variables of type int, double, boolean.
- Do simple arithmetic operations using ints and doubles
- Explain how int / double types can effect calculations
- Use pseudo code to write a java program by 'translating' the pseudo code statements into java statements in the IDE. The pseudo code becomes the documentation for the java program.
- Explain what Strings are and how they differ from the basic types

Module 5 Java Conditionals

Objectives:

- implement the if conditional structure in Java
- implement the if then else conditional structure in java
- implement the cascaded if then else structures
- implement the Java switch selection structure

Module 6 Java Input with Scanner Output with Printf

Objectives:

- read in user data values with Scanner
- do simple type checking with the Scanner.hasNextX methods to prevent exceptions from killing our programs

- do formatted output, particularly of double values with printf and for tabular displays

Module 7 Java Looping

Typically, this module takes two weeks of the semester.

Objectives:

- implement while loops for input bullet proofing
- implement for loops for fixed iteration
- use sentinel values for input looping with while and do .. while
- implement post test do while loops
- use random numbers

Module 8 Java Methods

Objectives:

- explain how static classes (Math) differ from Object classes (Scanner)
- explain typing of return types and parameters
- explain pass by copy and how primitive parameters are immutable
- implement void static methods to encapsulate reusable code statements (create procedures)
- implement static methods that perform and return the value of computations (create functions)
- use static methods to refactor existing java programs to make them more readable and maintainable
- use static methods to implement higher level pseudocode statements when coding
- explain and use method overloading

Module 9 Java Arrays

Typically, this module takes two weeks of the semester.

Objectives:

- use arrays to solve programs that use larger amounts of data
- use looping to iterate through arrays (traversal)
- do basic array and arraylist operations like sum, average, min, max etc.
- do sentinal based input with arrays
- understand how to resize an array and why we avoid it

Module 10 Java ArrayLists

Objectives:

- use arrays and arrayLists to solve programs that use larger amounts of data
- use looping to iterate through loops
- do basic array and arraylist operations like sum, average, min, max etc.
- do sentinal based input with arrays and arraylists

Module 11 Java Text File I/O

Objectives:

- open and read text data files from the system
- do basic statistical processing on text data: min max average, standard deviation
- use the java filechooser widget
- use try catch blocks to handle exceptions
- explain the difference between checked and unchecked exceptions
- write data to files
- create programs that persist the data input that a user provides by storing it in a text file.

UC Policies

Attendance: Students at the University of Cincinnati are expected to attend classes in order to meet the learning objectives for the course. Students are expected to follow the class attendance policy as outlined by the instructor. Students participating in official University sponsored activities, where the student is representing the University, will meet with instructor related to absences due to university-sponsored activities. When such absences occur, students need to provide documentation of the event(s), and work with the professor to develop a written plan for completion of missed assignments or other course requirements with as much advance notice as possible.

Communication: All university business must be conducted using a university assigned email account. The use of a personal, or non-university assigned email account to conduct university business is strictly prohibited. See full policy here.

Class Cancellation Policy: In the rare case that a class must be cancelled, faculty will post an announcement on the LMS that will be emailed to students. Faculty will attempt to communicate class cancelations with as much advance notice as possible. Students should be sure that their LMS email is current and valid to ensure emails are received. If the University closes due to inclement weather or other emergency situations, there will be an announcement posted on Blackboard (LMS) and if possible on the local news channels (TV and radio). Communications related to University closures will also be sent to the student's cell phone number on record through the automatic University emergency text messaging system. Students should notify the University if they change their cell phone number to ensure they will receive these important emergency communications.

Academic Integrity: The University of Cincinnati is committed to academic integrity. A formal articulation of this commitment is articulated in the Student Code of Conduct. Any

violation of these rules, including plagiarism or cheating will be handled on a case-by-case basis. At the least, you should anticipate a zero on an assignment, at the fullest extent, your violation will reported to the university and the incident will be documented on your permanent record.

Accessibility and Special Needs: The University of Cincinnati is committed to providing all students with equal access to learning opportunities. Accessibility Resources is the official campus office that works to arrange for reasonable accommodations for students with an identified physical, psychological or cognitive disability (learning, ADD/ADHD, psychological, visual, hearing, physical, cognitive, medical condition, etc.) Students are encouraged to contact the Accessibility Resources Office to arrange for a confidential meeting to discuss services and accommodations. Contact should be initiated as soon as possible to allow adequate time for accommodations to be arranged.

Counseling Services: All UC students have access to counseling and mental health care through University Health Services (UHS), which can provide both psychotherapy and psychiatric services. In addition, Counseling and Psychological Services (CAPS) can provide professional counseling upon request; students may receive five free counseling sessions through CAPS without insurance. Students are encouraged to seek assistance for anxiety, depression, trauma/assault, adjustment to college life, interpersonal/relational difficulty, sexuality, family conflict, grief and loss, disordered eating and body image, alcohol and substance abuse, anger management, identity development, and any other issues or concerns. After hours, students may call UHS at 513-556-2564 or CAPS Cares at 513-556-0648. For urgent physician consultation after-hours, students may call 513-584-7777.

Title IX: Title IX is a federal civil rights law that prohibits discrimination on the basis of a person's actual or perceived sex, gender, gender identity, gender expression, or sexual orientation. Title IX also address instances of sexual violence, dating or domestic violence, and stalking. If a student discloses a Title IX issue to a faculty member, the faculty member is required to forward that information to the Title IX Office. The Title IX office will follow up with the student and discuss how the University can take steps to address the impact on the student and the community. They will also inform the student of their rights and direct them to available resources. The priority is to make sure students are safe and successful here at the University of Cincinnati. Students are not required to talk to anyone in the Title IX Office. Students may also directly report any instance of sex or gender-based discrimination, harassment or violence to the Title IX office at 513-556-3349. Students who wish to know more about their rights and resources on campus, they can consult the Title IX website or contact the Title IX office directly at 513-556-3349.

NOTE: The instructor reserves the right to update this syllabus as class needs arise. Be assured that they will communicate to you any changes to the schedule, syllabus or policies quickly and efficiently.