**CSCI 132: Basic Data structures & Algorithms**

**Summer-2022**

**Meeting Times / Class Schedule**

* Lecture: From 6:00 p.m. – 8:20 p.m. (Monday through Thursday) Roberts 208

**Instructor**

* Adiesha Liyanage
  + E-mail: a.liyanaralalage@student.montana.edu
  + WebEx: https://montana.webex.com/meet/z72w146
    - If you have any questions please email me or ask during or after class.
    - And as needed, make an appointment if it's something you need to sit down and speak with me about. Usually I can stay after the class if you have any questions.

**Course Description**

This course is taught in Java. Most students coming into 132 have taken 127, which is taught in Python. There will be time spent teaching the differences between Python and Java. Students should understand control structures such as if statements, while loops, for loops, method calls, return values in methods, and the basis of object oriented programming. Students must therefore migrate from Python’s IDE to **IntelliJ** IDE for Java. I would not advise to use NetBeans or Eclipse as they are difficult to use. **IntelliJ** IDE for Java is easy and intuitive to use, therefore please use **IntelliJ** IDE. I will teach you how to install and use it. It’s very simple and intuitive. **IntelliJ** IDE has two versions **Community version** and **Ultimate version**. **Community version** is free to use whereas **Ultimate version** is not, However you can create a student account in which they would give the premium version for free. Therefore Ultimate version is free for students! All you have to do is sign up with your student e-mail and you can download the full version.

In this course, several topics related to coding in Java will be covered. Then, we will be moving on to more complex data structures and how they work. From there on, we will look at some simple algorithms for sorting and searching, as well as some more advanced topics such as recursion.

**The course consists of following parts: labs, quiz, final exam.** Exams.Quizes are expected to be performed individually. Therefore recommend being well prepared to take quizes and exams, as there will be a time limit to complete them. **To get good grades, please attend the lecture very carefully to understand the concepts fully**. If you have any questions please ask them during or after the class. Do not hesitate to ask questions, if I do not have an answer at that moment I will get back to you.

**Course Material**

* **Book:**
  + Data Structures and Algorithms 6th ed, by Goodrich, Tamassia & Goldwasser

**Course Outcomes**

At the end of this course, you should be able to:

* Have an improved understanding of the Java programming language.
* Understand the concept of an Abstract Data Type (ADT).
* Understand and be able to implement the list, stack, queue, and priority queue ADTs.
* Be able to determine the time complexity of simple algorithms.
* Understand and be able to implement several standard sorting techniques.
* Understand and be able to implement linear and binary search.
* Understand and be able to use recursion, exception handling, and Stream I/O.
* Have an understing of designing software - UML, and debugging a program.

**Policy**

* Please keep close eye on announcement(s) made in class or on Brightspace (**VERY IMPORTANT**).
* **No late submissions are allowed** unless an emergency occurs. **This is strictly enforced**. Brightspace will not accept late assignments. Please do not challenge this policy. If you forget to submit an assignment, you will get a zero for that assignment.
* **Academic dishonesty** results in an **automatic F** for you and who you copy from.
* You must cite all work that is not yours.

**Grading**

* Labs → 70%
* Exams (3) → 21%
* Quizes → 9%

**Exams will be held in class. If you cannot attend to an Exam please let me know in advance.**

**Depending on the situation I might give an extra credit lab for students.**

At the end of the semester, final grades will be determined as follows:

* 93+: A
* 90+: A-
* 87+: B+
* 83+: B
* 80+: B-
* 77+: C+
* 73+: C
* 70+: C-
* 67+: D+
* 63: D
* 60: D-

Tentative schedule for CSCI 132 summer 2022

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| Monday | Tuesday | Wednesday | Thurday | Friday (No classes) |
| 27-Jun  Introduction  Lab 1 | 28-Jun  Classes and objects | 29-Jun  Control flow  Lab 1 due | 30-Jun  Unit tests and other tools  Lab 2 | 1-Jul |
| 4-Jul  Fourth of July Holiday | 5-Jul  Lab 2 Due  OOP Concepts Introduction | 6-Jul  Interfaces Abstract classes and Exceptions  \*Review  Lab 3 | 7-Jul  Exam 1 | 8-Jul |
| 11-Jul  Fundamental Data structures  Arrays | 12-Jul  Lab 3 Due  Linked List | 13-Jul  Lab 4  Linked List continued | 14-Jul  Algorithm Analysis introduction | 15-Jul |
| 18-Jul  Growth rates and Big O notation | 19-Jul  Lab 4 Due  Algorithm Analysis continued | 20-Jul  Lab 5  Stacks  \*Review | 21-Jul  Exam 2 | 22-Jul |
| 25-Jul  Queues | 26-Jul  Lab 5 Due  Priority Queues | 27-Jul  Lists and ArrayLists  Lab 6 | 28-Jul  Recursion | 29-Jul |
| 1-Aug  Sorting  Lab 7 | 2-Aug  Dictionaries/Maps  Lab 6 Due | 3-Aug  \*Review | 4-Aug  Exam 3  Lab 7 Due | 5-Aug |