# COSC 237.101: Introduction to Computer Science II

FALL 2018

Department of Computer and Information Sciences, Towson University


**Instructor:** Professor Wei Yu (web: http://wp.towson.edu/wyu/)
**Class Hours:** Tuesday (YR301)/Thursday (YR 401) 3:30pm-4:45pm, Lab: Thursday (YR 301) 5:00pm - 6:50pm
**Office Hours:** Tuesday/Thursday: 2:00pm-3:00pm (Other times by appointment)
**Office:** 7800 York Rd. Room: 467
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**TA:** Mr. Weichao Gao (Email: wgao3@students.towson.edu), YR 451


### Course Description

This course provides an introduction to data structures and their implementations, computer systems concepts, the application of data structures in sort and search algorithms and the software development process. This is the second course in a sequence aimed at introducing students to computer science and programming. The emphasis is on object-oriented programming using Java, the design and implementation of data structures, recursion, searching and sorting algorithms, and basic algorithm analysis.

### Course Objectives

Upon completion of this course, students will be able to:

- Improve program design and coding skills acquired in CS I.
- Understand, explain and use fundamental concepts of object-oriented programming, including abstract and generic data types, encapsulation, inheritance, and polymorphism.
- Use this understanding to write object-oriented programs.
- Understand fundamental programming concepts and the use of a variety of data structures, including lists, stacks, queues, and trees.
- Use data structures to solve various computing problems.
- Understand and use basic concepts of algorithmic analysis, with an introduction to the time efficiency of various searching and sorting algorithms.
- Design recursive and iterative solutions to problems.

The overall objective is to provide students object-oriented programming skills and a firm foundation for further study in computer science or information systems.

### Required Textbook

Stuart Reges and Marty Stepp, "Building Java Programs: A Back to Basics Approach," 4th edition/ ISBN: 978-0134322766. More information about this textbook can be found at http://www.buildingjavaprograms.com/

*The textbook is necessary for this course. It is expected that all students have a copy of the book to use during the semester.*

### Additional Reading/References

*(Optional)* D. S. Malik, Java Programming: Program Design Including Data Structures (**2006 Edition**), Thomson ISBN-13: 978-1-4188-3540-8. ISBN-10: 1-4188-3540-4.

### Software and Lab

All programming in this class will be done with the Java programming language. The software development environment for the course will be DrJava (or any other Java development tool available in

our labs). As these are open labs and you are using public machines, you will want to make arrangements for saving your work (e-mail, Tiger File space, WebDisk, USB memory sticks, etc.).

You will submit all lab assignments electronically through the assignment submission page in blackboard.

If you cannot finish the lab assignments during the one-hour lab session, please see the COSC labs web pages (http://wwwnew.towson.edu/cosc/cosclabs) for details on lab hours and tutoring services.

**Prerequisite:** COSC 236 (C or better).

**Corequisite:** MATH 211 or MATH 273. (TU catalog)

**Course Organization**

Coursework will consist of several lab assignments, two tests and a final exam. Although they do not account for a large portion of the grade, the lab assignments must be completed in order to do well on the exams. It is very important that you complete all programming assignments: most students will find it extremely difficult to do well on the tests if they do not do the labs/ homework. Also, it is important that you attend all class meetings in a week. It is the student's responsibility to make up for missed work.

**Assignment Handout, Completion and Submission**

All assignments will be posted on the class course space on Blackboard: they will not be distributed on paper. Please check the site regularly for updates, assignments, solutions, and other relevant information.

**Grading**

| **Assignments** | |
|---|---|
| Assignments | 30% |
| Participation/ Attendance | 10% |
| Exam 1 | 20% |
| Exam 2 | 20% |
| Final Exam | 20% |
| Total | 100% |

| **Grading Scale** | |
|---|---|
| A | *93 – 100* |
| A- | *90 – 92.99* |
| B+ | *87-89.99* |
| B | *83-86.99* |
| B- | *80-82.99* |
| C+ | *75-79.99* |
| C | *70 – 74.99* |
| D+ | *67-69.99* |
| D | *63-66.99* |
| D- | *60 – 62.99* |
| F | *Below 60* |

Some suggestions, guidelines, and policies:

- *Submit your assignments on time*: An assignment that is half-done and on-time is more valuable than something that is perfectly done but late. Late assignments will receive 0%.
- *Be prepared to put time into the work outside of class*: The lab time in each week is intended as a time for you to work on assignments in an environment where both I and the TA will be around for support. The lab is *not* intended to be the full-extent of the time that you spend on the assignments. If you don't put in enough time outside of class, you will likely find it hard to do well in this course.
- *Duration*: Some assignments will be one-week long and some may cover multiple weeks.
- *Grading*: Grading individual assignments is usually not an informative process in a class such as this. Myself and the TA will provide you with feedback - probably by creating a file in your class file space - for each assignment, but likely not for each problem. If you ever have any questions about why you were given the grade that you were given, please feel free to ask myself and/or TA.

**Policies**

- *Attendance and class behavior*
    - This class is not just a lecture. During the class session, I may use exercises, questions, and other "active learning" approaches that may challenge you to work on and solve problems.
    - Coming to class shows your commitment to doing the work and learning the material. Class participation and attendance count for 10% of your grade.
    - Please come to class on time, and expect to stay for the entire class. There may be times when circumstances beyond your control make it necessary for you to arrive late and/or leave earlier. Barring such circumstances, please arrive for an on-time start to lectures and labs.
    - Please don't use cell phones, pagers, laptops, etc. in class. These devices are distracting to instructors and students alike.
- *Exams*

  This class has two mid-term exams and one final exam. As these tests make up the bulk of your grade, your attendance for tests is particularly crucial. If you miss a test without presenting verifiable documentation of the reason for your absence, your grade for that exam will be zero. This information must be presented in a timely manner: if you do not provide documentation within 1 week of the test, your grade will be zero.
- *Homework & Labs*
    - The lab assignments will be homework for this course. You will start working on each assignment independently during lab, and hand it in before the start of the following lab session.
    - Lab assignments may be weekly, or may span multiple weeks.
    - Although the homework and labs only count for 30% of your semester grade, it is vitally important that you complete the assignments: most people will find it extremely difficult to do well on the exams if they do not do the homework.
    - Working in pairs can be helpful for people in introductory computing courses, but this should not be an excuse for one partner to do all of the work: both partners will be expected to understand the work that was done. If you choose to work with a partner, you should hand in one assignment with both names on it. You may choose to work with different partners on different weeks, or to work individually on some assignments and with partners on others, but you may *not* work with more than one partner on any assignment. Resolving any conflicts that arise due to work done with a partner is your responsibility.
    - All assignments will be handed in on the due date. Late assignments will not be accepted. However, since the material in this class is cumulative, you should complete all assignments, even if you will not get credit for them.

**Absence Policy**

It is the responsibility of the student to determine and understand clearly the faculty member's attendance policy. If a student is absent and requests permission to make up class work or an examination, the faculty member has the right to request verification of the reason for the absence.

**Cheating and Plagiarism**

A statement on cheating and plagiarism distributed to all students may be found in the Undergraduate Catalog, Appendix F, which includes Plagiarism, Fabrication and Falsification, Cheating, Complicity in Academic Dishonesty, Abuse of Academic Materials, and Multiple Submissions. Failure to do so will result in an official notification to the Office of Judicial Affairs and will result in **at least a zero** on the

assignment with the possibility of **course failure** depending on the severity. Discussions among students fosters learning, however, work must be individually prepared unless otherwise specified. **All assignments must be submitted in electronic format**, so that papers can be assessed for academic integrity.

**Disability and Other Statements**

If you may need an accommodation due to a disability please contact me privately to discuss your specific needs. A memo from Disability Support Services (DSS) authorizing your accommodation will be needed. Students should not attend classes or other university events from the onset of flu-like symptoms until at least 24 hours after the fever subsides without the use of fever reducing medications. Such absences will be considered excused absences; however, students are responsible for the material covered during the period of their absence.

**Repeating a Course**

Students may not repeat a course more than once without prior permission of the Academic Standards Committee

**Third Attempts in this Course**

Please note: Only under exceptional circumstances will the department accept a third attempt of this course. It is the policy of the Department of Computer and Information Sciences to deny any third attempts that are not in the best interest of the student. If this is your third attempt of this course, you must fill out a Third Attempt Petition and have it approved before continuing in this course. Third Attempt Petitions are available online at the following link or can be picked up in the CIS department front office.

**TU Courseware Account**

Towson's BlackBoard courseware application will be used to enhance students' learning experience in this class. Students are required to obtain a Blackboard account, and self-enroll in the course (blackboard.towson.edu). All assignments, class handouts, discussion forums and general course information will be managed through this site.

**Computer Labs on Campus:**

Towson University has a number of computer labs available on campus for student use.

**Posting of Grades**

Please note that it is University policy not to post grades in a public place after the semester is completed. If you would like to receive your individual grade at the end of the semester, please make arrangements with me.

**Food and Drink**

No food or drink is allowed in the labs; no food is allowed in the classrooms.

**Electronic Devices in Class**

Cellular phones, pagers, CD players, radios, and texting and instant messaging are prohibited in the classroom.

**Reservation Statement**

The instructor reserves the right to make adjustments to the syllabus as needed.

**Tentative Class Schedule (This schedule is approximate and subject to change)**

| Week | Date | Topic | Reading |
|---|---|---|---|
| 1 | 8/28, 8/30 | Assessment Test, Course Introduction, Primitive Data & Loops | Chs.1-2 |

| | | | |
|---|---|---|---|
| 2 | 9/4, 9/6 | Parameters & Objects, Conditional Execution, Program Logic & Indefinite Loops | Chs.3, 4, 5 |
| 3 | 9/11, 9/13 | File Processing, Array | Ch.6-7 |
| 4 | 9/18, 9/20 | Class | Ch. 8 |
| 5 | 9/25, 9/27 | Inheritance | Ch. 9 |
| 6 | 10/2, 10/4 | ArrayLists | Ch. 10 |
| 7 | 10/9, 10/11 | Exam 1 (10/12), Recursion | Ch.12 |
| 8 | 10/16, 10/18 | Recursion, Search Sorting | Chs.12-13 |
| 9 | 10/23, 10/25 | Search Sorting | Ch.13-14 |
| 10 | 10/30, 11/1 | Stacks and Queues | Ch.14 |
| 11 | 11/6, 11/8 | Exam 2 (11/09), Stack and Queues | Chs.14 |
| 12 | 11/13, 11/15 | Linked List | Ch.16 |
| 13 | 11/20 | Linked List | Ch.16, 17 |
| 14 | 11/27, 11/29 | Binary Tree | Ch. 17 |
| 15 | 12/4, 12/6 | Exam Review, Additional Structure - Graph | |
| | | **Final Exam:**<br>**December 18 (Tuesday), 3PM-5PM, YR 301** | |