CIS 203 Computer Science II

Textbook:	None required.
Instructor:	Dr. Laura Grabowski
Office Hours:	TBA
Class Time/Place:	MWF 9:00 AM – 9:50 AM (3 contact hours) / Dunn 206
Lab Time/Place:	M 2:00 – 3:50 PM (2 contact hours) / Dunn 302
Credits:	Lecture: 3 credits; Lab 1 credit (Note: concurrent enrollment in lecture and lab is required)
Prerequisites:	CIS 201 with minimum grade of 2.0

Course Description:

More advanced programming: modeling problem domains with user-defined classes and class hierarchies, composing classes to program solutions; implementing generic containers; programming to an abstract interface. Testing code to document its behavior, communicating what it does and how to evaluate its correctness. Analysis of more complex algorithms with empirical measurement. Prerequisite: CIS 201 with minimum grade of 2.0. Laboratory required. Fall and Spring.

Student Learning Outcomes:

CIS 203 Computer Science II advances student understanding of computer programming and computer science beyond CS I.

Upon finishing this course, students will be able to:

1. Apply interfaces and polymorphism to program their own classes.
2. Implement programs using standard collections to solve problems involving searching, sorting, and other algorithms.
3. Implement dynamic, recursive data structures such as linked-lists, reflecting the structure in recursive code.
4. Summarize the stored-program computer concept, including encoding of instructions and int, double, and String data types.
5. Apply standard debugging techniques such as describing expected *versus* actual program behavior and finding and fixing program bugs.

Course Requirements and Grading:

1. **Weekly Quizzes: 10 %**

   A quiz will be given starting the second lecture of the course. Quizzes take material from previous lectures, labs, meaning, if you don't finish the lab, or revise lecture materials you may not be prepared for the quiz. This will also be counted as your attendance.

2. **Programming Assignments: 25 %**

   Several programming assignments will be given based on the concepts discussed in lectures. These programming assignments will be the essential part of the course. Programming assignments will be posted on moodle page along with the due date. Late assignments are penalized at 20% per calendar day that they are late. Your final submitted assignment should represent your individual work; it is, however, acceptable to discuss the solution approach with other students. You will be responsible for keeping track of programming assignments due dates posted on moodle. Assignment submission policies are detailed in a separate section of this document.

3. **Exams: 40%**

   a. Midterm 1 – 13 %
   b. Midterm 2 – 13%
   c. Final Exam – 14 %

   Exams are closed book and closed notes. Any request for re-grading must be received in email and within 3 days of receiving your graded exam back. Prior notice must be given to your instructor if you can't make it to exam. No make-ups will be granted unless satisfactory documentation is produced to show an extenuating circumstance.

4. **Labs: 25%**

   - ***Lab instructions:*** Labs will be available on Moodle each week under lab course page
   - ***Making the Best Use of Lab:*** Each lab will be based on material that was covered in lecture and the online prelab reading.
   - ***To prepare for lab:***
     - Attend lectures
     - Do the assigned homework as we discuss the associated material in class.
     - Print and read the lab instructions.
   - ***Working through the laboratory exercises:*** For a given lab, you will work through the lab exercises as described in the instructions. The laboratory exercises contain checkpoints. When you reach a checkpoint, your lab instructors will check you off.

     Laboratory Grade: The lab component of your grade is simply the percentage of checkpoints that you complete over the semester. For example, if you complete 70 out of 80 checkpoints over the semester, your lab grade will be 70/80 = 87.5%.

Course Policies

1. **Late work**

   All due dates for the course will be strictly enforced. Prior approval will be required from the instructor for any late submission, including making up missed exams.

2. **Attendance**

   Attending all lectures and labs and completing required work is crucial to your success in this course. While attendance is not graded *per se,* in-class graded work cannot be made up without prior arrangement with the instructor. In the event of absences from weekly labs, you are required to complete the missed lab work before the beginning of the next lab session. The instructor and CS tutors will be available to help you with completing labs during posted office and tutoring hours.

3. **Absences**

As noted above, in-class graded work cannot be made up without prior arrangement with the instructor.

Accommodation of Religious Observances: I will make reasonable accommodation for a student's religious beliefs. Please notify me within the first week of classes about any scheduled class date that conflicts with a religious observance.

4. **Academic Integrity**

You are expected follow the "SUNY Potsdam Academic Honor Code" (SUNY Potsdam Undergraduate Catalog, https://catalog.potsdam.edu/content.php?catoid=7&navoid=566) by doing your own work on all required work for the course unless specifically directed otherwise by the professor. **Copying is strictly forbidden, regardless of the source** (online, other students). Students caught cheating will receive a grade of 0 for that evaluation. More than one offense will result in dismissal from the course and possible disciplinary sanctions by the university. Academic Misconduct definitions, procedures, due process, and student rights are described on page in the SUNY Potsdam Undergraduate Catalog, as cited above.

5. **Grade Distribution**

At the end of the semester, I will calculate what fraction of the possible points you have earned, and your grade will be based on this distribution:

4.0:	95 – 100%
3.7:	90 – 94%
3.3:	85 – 89%
3.0:	80 – 84%
2.7:	77 – 79%
2.3:	73 – 76%
2.0:	70 – 72%
1.7:	67 – 69%
1.3:	63 – 66%
1.0:	60 – 62%
0.0:	<60%

Note that final grades may be scaled using a class course-grade average.

Tentative Schedule:

	Topics	*Assignment*	*Lab*
Week 1	Syllabus, class policies; digital, binary, general-purpose computers; running-time and resources	Assignment 1	Lab 01
Week 2	**Review:** arrays; loops; nested loops	Assignment 2	Lab 02
Week 3	Interfaces and classes; implementing an interface; writing and compiling classes	Assignment 3	Lab 03

Week 4	Interfaces as *data types*; more writing and compiling classes; **review**: if-else	Assignment 4	Lab 04
Week 5	Java List interface; using ArrayList; filling a list from a file	Assignment 5	Lab 05
Week 6	Review & Midterm 1	Assignment 6	Lab 06
Week 7	Implementing the List interface; List add, remove, traverse	Assignment 7	Lab 07
Week 8	Linked lists; embedded class definitions; references and data encoding	Assignment 7a	Lab 7a
Week 9	Key-value pair class; linked dictionary; add, remove, traverse, search linked dictionary	Assignment 8	Lab 08
Week 10	Review & Midterm 2	Assignment 9	Lab 09
Week 11	Recursion; calling stack; recursive functions	Assignment 10	Lab 10
Week 12	Recursive Linked Lists; function overloading	Assignment 10a	Lab 11
Week 13	Introducing big-O; linear search; recursive binary search Quadratic sorting; counting the cost	Assignment 11	Lab 12
Week 14	n log(n) sorting; **review**: ArrayList; recursion	Assignment 12	Lab 13
Finals	Final exam, time/place TBA		