INSTRUCTOR INFORMATION

Instructor: Cassandra Thompson
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Office: Hilger Hall Tech Center, Room 9 (HLGR TC09)
Office Hours: 5 – 5:45 pm Thursday, or by appointment

Textbook: A First Course in Computational Thinking - Symms, St. George, Feil and Johnson.
Please keep this syllabus for reference throughout the semester—this is your guide to this course. All of the course rules, instructions, and important dates are listed here.

Calculator: None required.

Prerequisite: MAT101 or equivalent

Course Overview
Computational Science is an interdisciplinary field that seeks to simulate real-world phenomena. Simulations involve using mathematical models and computer models to generate data, which is then analyzed to assess the models, to make predictions, or to estimate. Simulations can require enormous numbers of computations, so it is with recent advances in computational power and applied mathematics that Computational Science has become an integral part in doing modern science. For example, in computational pharmacology, simulations are run to test new drugs before using live specimens, providing for the development of more accurate drugs. As future practitioners, you may not be implementing simulations, but at minimum this course will enhance your computational skills, expand your understanding of ways mathematics and computer science are used in modern science, develop extensive data-analysis skills.

Course Objectives
This course will introduce students to:

- Some essential elements of computational science;
- Basic statistical analysis concepts;
- Essential computer literacy skills.
Learning Outcomes:
By the end of this course, students should be able to:
- Design, implement and analyze simulations that mimic real-world phenomena. (Obj 1-3)
- Make the connection between real-world processes and their corresponding mathematical models. (Obj 2)
- Analyze data (simulated and real) using linear regression models. (Obj 1-3)
- Create and interpret appropriate visualizations of (simulated and real) data sets. (Obj 1-3)
- Analyze (simulated and real) data sets using descriptive statistics and basic inferential statistics. (Obj 2)
- Communicate with a computer using both graphical and text interfaces. (Obj 1, 3)

Course Format
In general, the class will be a combination of lectures and lab work. I provide students with FIVE to SIX opportunities to comprehend the material. There is a hand computation exercise during the lecture, a class demonstration during the lab, homework exercises, a review of selected homework question items, and a teach-to-learn exercise at the beginning of class. The teach-to-learn exercises are typically a review of material we learned from the previous class session. Additionally, I will reserve time during class for a midterm and final exam review one to two weeks before the exam is due. Note about the midterm exam and final exam review sessions: Because class attendance is not required for the exam review sessions, I will wait in class for 10 minutes for students to attend the review sessions. After approximately 15 minutes, I will leave the classroom if no students attend the review session. If you do not understand the material after lectures, labs, teach-to-learn exercises and the review sessions, please schedule an office appointment.

Student e-Mail: Carroll University offers a student e-mail account for all students. All communication with your instructor must be sent through your Carroll University email address. This helps to protect the privacy of your personal information. You are responsible for monitoring your student e-mail account.

When you have a question, comment, or concern and would like to send me an email, these are your instructions:
- include your full name and the course name
- Please do not compose an email as you would compose a text message: email as if you are writing a formal letter.

Write emails that are clearly written and explicated—pretend I am a complete stranger who has never met you and would not understand your question or comment without a clear contextual anchor. Please give your question or comment a sense of “history” so I can understand your question
Submitting Work for this Course: All coursework is managed through Canvas.

Staples
Always have your papers stapled, at an angle, in the upper left corner, as close to the corner as possible. NOTE: the electronic staplers often staple deep into page making it difficult to review subsequent pages. Please avoid this staple positioning. Be sure your papers are printed and stapled “prior” to class start.

Printing
By default assignments should be printed back-to-back (both sides of the paper). If your printer does not print on both sides of the paper, that is OK! You do not need to contact the instructor to ask if it is OK to print on one side. Assignments that say, “Print on both sides” will not lose points if they are printed on one side only.

There are “some” (not many) assignments that require you to print on “ONE” side only. This “is” a requirement and will be clearly defined in the instructions. Failure to do so will result in loss of points.

Excel worksheets.
Excel assignments that are printed landscape, must use the following instructions for inserting into the packet.

- Turn worksheet 90 degrees counter clockwise. This will result in the top of the worksheet being on your left.
- Keeping that rotation, insert sheet into required location of packet.
- If you are only submitting landscape excel sheets, again rotate as described and staple in the upper left.

COURSE REQUIREMENTS

Attendance
Students are NOT expected to attend all classes. If you miss a class, you are responsible for any assignments or announcements made. NOTE: if the instructor requires the student to leave the class because of disruptive classroom behavior or the student leaves the class early, the student will be marked absent and will not earn credit toward the final grade bonus.

Examinations
Exams will measure both your conceptual understanding of the material and your problem solving skills. There will be one midterm test and a final exam. Each exam should be considered cumulative. However, each exam will focus more on recently covered material. Exams will include questions concerning concepts as well as practical application of skills. I do not give make-up exams, except in cases of documented emergencies, or if prearranged, with approval.
Exams will be given on the dates listed on the course syllabus; however, the instructor reserves the right to move the exam date. Both the midterm and final exam will be take home exams. Please consult the class schedule for the due dates. Students will submit the midterm and final exam to Canvas by 11:59 PM on the deadline stated in the class schedule. The instructor may impose a half-letter grade penalty for late midterm and final exams. Midterm and final exams that are two or more days late will receive a zero in the gradebook.

Note: the instructor may not cover all material from the textbook during the lecture and lab sessions. Students are responsible for learning ALL material stated in the syllabus.

Make-up exams will only be given to students with a documented excuse, or in extenuating circumstances.

Homework
Students will have the opportunity to complete 13 homework assignments but only 11 assignments will count toward the student’s final grade. The instructor will drop the student’s TWO lowest homework grades. Or, the student may have the option of skipping TWO homework assignments. In other words, students get TWO “freebies” in the class. Special note: students are required to complete homework assignments 1 to 4 so I can monitor your performance in class. Because homework assignments 1 to 4 are required, the instructor may impose a half-grade or 5 percent late penalty on the condition the instructor has not graded the assignment and reviewed the answers in class. Starting with homework assignment 5, students may exercise their right to skip a homework assignment. Homework assignments 5 to 13 submitted after the class deadline will require the student to use one of their TWO “freebies.”

The instructor will not reschedule or renegotiate a new “freebie” with the student. If you decide to skip a homework assignment, you are still responsible for learning the material. Please consult the class schedule for due dates on homework assignments.

Bonus: 3 Percent Points (Extra Credit) on Final Grade
Class attendance is not required for the course. Yet, attendance and participation in the class is important. The instructor will add three percentage points to your final grade depending on THREE components: (1) the student’s weekly class attendance with only one absence, (2) participation in the teach-to-learn activities, and (3) attendance at both the midterm and final exam review sessions. To earn the full 3 percentage bonus points, students must successfully complete all THREE components to the satisfaction of the instructor. In order to record your attendance and participation, please follow the instructions and either post your work on elearning or personally hand your work to the instructor by the deadlines. Please remember to sign the attendance sheets for the weekly class sessions and exam review sessions. NOTE: The final grade bonus of 3 percentage points is all or nothing; no partial points will be awarded.

In-Class Exercise
For each class session, students will be given activities to help them learn the material. Students will upload their answers to the class exercises or submit a worksheet of the answers to the instructor at the end of class. If you are not present for the activity, you will earn credit toward the final grade bonus. Additionally, if the instructor requires the student to leave the class
because of disruptive classroom behavior or the student leaves the class early, the student will not earn credit toward the final grade bonus.

**Teach-to-Learn Exercise**

*Class participation means more than simply being present; students learn the material when they regularly contribute in a meaningful way during class.* Throughout the semester, the instructor will assign students (as a group or individually) to summarize, discuss and or explain selected topics or work problems before the class. The teach-to-learn exercise is an opportunity for you to share what you know with your classmates because we all learn from each other. Additionally, this exercise provides students a way to boost their final grade in the class. NOTE: the teach-to-learn exercises are optional. Students wanting to improve their overall grade will sign up for a date and topic. If a student is absent on the assigned day for the teach-to-learn exercise, every effort will be made to schedule another day. However, depending on the number of students and the days left in the semester, rescheduling a teach-to-learn exercise may not be possible. Because the teach-to-learn exercise is not a formal part in calculating your final grade, the instructor is not obligated to reschedule a teach-to-learn exercise even for university approved absences.

**Exam Review Sessions**

The instructor will hold a midterm and final exam review session at least one week before the exam. In order to earn the final grade bonus, student must attend and complete exercises for both the midterm and final exam review sessions. Please remember to sign the attendance sheets for the exam review sessions; otherwise, the student will be considered absent. Additionally, if the instructor requires the student to leave the class because of disruptive classroom behavior or the student leaves the exam review early, the student will not earn the final grade bonus.

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**COURSE GRADE**

Grading: Homework (40%), Midterm (30%), Final Exam (30%)

The grading scale is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
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<tbody>
<tr>
<td>A</td>
<td>[93-100]</td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td>[89-92]</td>
<td></td>
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<tr>
<td>B</td>
<td>[83-88]</td>
<td></td>
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<tr>
<td>BC</td>
<td>[79-82]</td>
<td></td>
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<tr>
<td>C</td>
<td>[71-78]</td>
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<tr>
<td>D</td>
<td>[61-70]</td>
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<tr>
<td>F</td>
<td>[0-60]</td>
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</tbody>
</table>

The instructor may not cover all material from the textbook during the lecture sessions. Students are responsible for learning ALL material stated in the syllabus.

The instructor will discuss a student’s grade with him or her, however: (a) grade discussion will occur during office consultation and will not occur via email, and (b) a student’s grade will not
be changed on any assignment, nor will his or her final grade be adjusted unless justifiably warranted (i.e., error in grading). For the convenience of the student, the instructor will schedule office virtual office meetings through Skype or elearning. Students are allowed 7 calendar days from the receipt of their graded work to notify the instructor of any errors or dispute evaluation using the Grade Dispute Form. Grade adjustments (e.g., poorly worded item on an exam) will occur at the instructor’s.

**Grade Review Requests or Student Course Concerns:** The instructor will correct calculation errors on assignments or exams promptly. For other grade disputes, the student is required to complete and follow the procedures on the Grade Review Form. Please see grade review form (attached below) for instructions.

**Grade Reduction:**
The instructor reserves the right to reduce your final grade by half-a-letter-grade or 5 percentage points for any of the following reasons:
- If you frequently text, surf the internet, or sleep in class,
- If you insult your classmates and/or the instructor,
- If you are disruptive in class and/or a poor class citizen,
- If you chat with other students about topics unrelated to the class during the lecture and impede other students’ learning.

**Academic Integrity Policy**
The Carroll University Academic Integrity Policy is located in your student handbook. Please know that students committing acts of academic dishonesty will suffer severe consequences. Plagiarism is a serious offense. If a student violates the academic integrity policy, I reserve the right to give the student one or a combination of the following sanctions: (1) a failing grade for the course, (2) a failing grade for that particular assignment, or (3) a failing grade for the assignment and a final grade percentage penalty, which would be determined by the instructor. If the instructor discovers incidents of academic integrity involving group collaboration, the instructor reserves the right to assess a group or individual penalty. I encourage students to collaborate and work on assignment together in order to learn the course material; however, I expect all students to do their own work.

The instructor will issue a stern warning or assess a sanction in regards to plagiarism, which all students are expected to heed. It is incumbent upon the student to discuss with me and clarify any concerns they might have about what might constitute as plagiarism. Ignorance of the rules is no excuse for violating the academic integrity policy.

**Students With Special Needs**
Students with documented disabilities needing accommodations or any student considering obtaining documentation should make an appointment with the Director of Services for Students with Disabilities, no later than the first week of class. If you have questions about disabilities or disability services, contact us at wyc@carrollu.edu, or call 262-524-7335. Office hours are 8 am - 4:30 pm. Monday through Friday.
Carroll Portal (ELearning): This class will use the Carroll Portal for various purposes. Homework descriptions and data files will be posted there as needed. Your grades will be posted there when available. Please keep track of your grades yourself as well, and if you notice any errors, please let your instructor know as soon as possible.

Computer, Cell Phones, Electronic Device Policy: This class is being held in a computer classroom. It is expected that all computer use be class-related. Chat programs, email, games, social media interaction, and unrelated browsing are not to be used during class. Cell phones must be turned off in the classroom. Do not listen or use an iPod, or other device, during class. Do Not Text. Student screens can be seen from the main terminal, and students observed breaking this rule will be asked to leave and marked absent for the day. Note that cellphones, and mobile devices are all small computers, so this rule applies to them as well. Students asked to leave the class because of violating the electronic device policy will not earn credit toward the final grade bonus.

Course Modification
The instructor and the University reserve the right to modify, amend, or change the syllabus (course requirements, grading policy, etc.) as the curriculum and/or program requires. Students will be notified of any changes during the lecture periods.

Carroll Portal (MyCourses): This class will use the Carroll Portal for various purposes. Homework assignments will be posted there; so will any handouts/resources you will need. Your grades will be posted there when available.

### Class Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Readings</th>
<th>Assignment Due Dates</th>
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<tbody>
<tr>
<td>Sep 7</td>
<td>Chapter 1, 2 Introduction to Computational Science; some history on computation; introduction to simulations. ***If time permits, start Chapter 3</td>
<td>Homework Assignment 1 Chapter 1.2, 3.1 Due date: Sep 18</td>
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<tr>
<td>Sep 14</td>
<td>Excel Basis Chapter 3.1-3.3</td>
<td>Homework Assignment 2 Chapter 3.2-3.3 Due date: Sep 25</td>
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<tr>
<td>Sep 21</td>
<td>Excel Basis Chapter 3.4-3.5, 4</td>
<td>Homework Assignment 2 Chapters 3.4-3.5, 4 Due date: Oct 2</td>
</tr>
<tr>
<td>Sep 28</td>
<td>Python Chapter 5.1-5.3</td>
<td>Homework Assignment 3 Chapter 5.1-5.3 Due date: Oct 9</td>
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<tr>
<td>Oct 5</td>
<td>Python Chapter 5.4-5.7 *If time permits, start Chapter 6</td>
<td>Homework Assignment 4 Chapter 5.4-5.7 Due date: Oct 16</td>
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<tr>
<td>Date</td>
<td>Chapter(s)</td>
<td>Homework Assignment</td>
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<tr>
<td>Oct 12</td>
<td>Chapter 6,7</td>
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<tr>
<td>Oct 19</td>
<td>Chapter 8.1, 9.1-9.4</td>
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<tr>
<td></td>
<td>Midterm Exam Review</td>
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<td></td>
<td><strong>MIDTER EXAM</strong></td>
<td>Oct 28</td>
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<tr>
<td>Oct 26</td>
<td>Chapter 10.1-10.5</td>
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<tr>
<td>Nov 2</td>
<td>Chapter 10.6-10.8</td>
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<tr>
<td>Nov 9</td>
<td>Chapter 12</td>
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<tr>
<td>Nov 16</td>
<td>Chapter 14.1-14.4</td>
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<tr>
<td>Nov 23</td>
<td>****NO CLASS THANKSGIVING BREAK</td>
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<tr>
<td>Nov 30</td>
<td>Chapter 14.6-14.8</td>
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<tr>
<td>Dec 7</td>
<td>LAST CLASS DAY</td>
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<tr>
<td></td>
<td><strong>Final Exam Review</strong></td>
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<td></td>
<td><strong>FINAL EXAM DUE</strong></td>
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Grade Review Form

Name: _______________________________  Effective Date: _______________________________

The effective date begins when the instructor returned the assessment to the entire class not when the student checked their grade on Canvas.

Students are given 7 calendar days to request a grade review. Please note: it is incumbent upon the student to verify the Grade Review Form and documentations were submitted to the instructor AND received by the instructor in accordance with deadlines. The instructor will re-grade the entire assignment/exam, not just the disputed question item(s) to ensure uniform grading practices.

The instructor will reject a Grade Review Form if the student cites:

• the material for a question item was not covered during the lecture. Students are responsible for learning ALL material listed in the syllabus.
• different vocabulary words were used on the exam/assignment other than the textbook or lecture. The instructor expects students to use an online dictionary or ask the instructor to clarify a term before or during the exam/assignment.
• a classmate(s) received a higher grade or was awarded additional points on a question item; it is the student’s responsibility to provide evidence from the textbook or lecture notes on why the student’s (individual) grade received was scored inaccurately.
• technical flaws (typos, grammatical error, conceptual wording) in the question item. Unless the technical flaw impeded comprehension and question item clarity, or prevented the student from deciphering a definite solution, the student is expected to answer the question item(s).
• the deduction of points for failure to follow instructions, meet exam/assignment deadlines, document thinking, and upload required files to elearning.

GRADE REVIEW PROCEDURES

1. On grade review form or a separate sheet of paper, the student will describe the issue or grade item(s) for the instructor to review and attach relevant documents as evidence. The student will either email or personally hand the review form and documents to the instructor. Reliable sources to use as evidence include the assigned textbook (with page numbers) and/or a copy of the instructor’s lecture notes. Other readings or materials outside of the class will not be considered as evidence for a grade review or a class re-evaluation decision.

2. The student will schedule a face-to-face meeting with the instructor to discuss the completed grade review form and other documents. A face-to-face meeting is required so the instructor clearly understands the student’s concerns.
By signing this grade review form, the student understands the instructor will re-grade the entire exam/assignment. The percentage points the student receives from a re-graded exam or assignment may increase or decrease. **A regraded exam or assignment may result in a lower score than the original assessment.**

The student agrees to accept the re-graded score as the final grade for the assignment/exam in the event re-graded assessment or re-evaluation is lower than the original exam/assignment.

The instructor will email a written decision, **the Instructor Grade Review Report**, to the student within **3 calendar days** after receiving the grade review form with the required documents AND after the face-to-face meeting with the student. Deadlines will not be extended or waived for students with an incomplete application for a grade review request. To be clear, a completed grade review request consists of three items: (1) a written description of the course action the student is requesting the instructor to reconsider, (2) a signed grade review form, and (3) a face-to-face meeting with the instructor. Completing only one of the grade review requirements will not trigger a grade review decision even if one of the requirements were completed on deadline. **To accommodate the student’s schedule, the instructor is willing to conduct virtual office meetings through Canvas or Skype.**

The grade review form does not invalidate the student’s right to appeal an instructor decision. Students have the right to appeal the decision to the department chair or dean; however, the instructor, at her discretion, reserves the right to reject any course action until the student completes the grade review form and schedules a face-to-face meeting with the instructor.

**STUDENT WRITTEN RESPONSE:**

Student signature: _____________________________________________ (required for re-evaluation)

Date:_________________________________________________________ (required for re-evaluation)