

Welcome To CS 446 —
Computational Modeling & Simulation II
(Interdisciplinary Science Research)
Colby College, Fall '20

Course: CS 446 — Computational Modeling & Simulation II (Interdisciplinary Science Research)
Class Meetings: T / R 11:00AM–12:15PM, meetings in ... (It's complicated ...)
Website URL: <https://cs.colby.edu/courses/F20/cs446>

Course Description

A research-oriented continuation of Computational Modeling and Simulation I. Students work in teams to complete a semester-long project in an interdisciplinary area, applying computational modeling and simulation techniques to address a research question. This involves all of the following: reading peer-reviewed articles; understanding the context of a research question in a research community; designing and implementing experiments and analyzing their results. Each team will produce a journal-style article and an oral presentation describing their project.

Prerequisites: Computer Science 346.

Your Professor: Eric Aaron

Website: <https://cs.colby.edu/eaaron>

Office: Davis 113

Office Hours (which may change if demands arise): M 2:30–4:00pm, Tu 12:30–1:30pm,
W 2:30–4pm, Th 12:30–1:30pm, and by email appointment

Please feel free to come by and chat—I look forward to talking with you!

Phone/Voicemail: 207-859-5857

E-mail: eaaron@colby.edu

NB: The above email address is the best way to contact me.

Course textbook

- None, but CS346 textbook *Introduction to Computational Science* by Angela B. Shiflet and George W. Shiflet may still be useful.

Grading: Your grades for the course will be computed based on

- Research Project (including manuscript and video presentation): 50% (There will not be a Final Exam for the course.)
- Class presentations and in-class “check-ins”: 20–25%
- Small assignments and Class Participation: 15–20%
- Final reflection assignment: 10–15%

The above percentages may be changed if administrative concerns demand it.

Desired Course Outcomes

- Students can use online databases to identify peer-reviewed literature relevant to their research topic. Students can identify a research community in which their research topic is relevant as well as published articles in that community that are most relevant to their research.
- Students can explain at least one research question, and explain and apply at least one associated computational model. Students can effectively apply at least one technique of simulation or analysis.
- Students can ask questions of interest to their research community about their system and its model. Students can write appropriate programs to produce and / or analyze results, using programming techniques and style to create validated, well documented code that is easy to extend and maintain.
- Students can perform their research within a team, and they can present and discuss their research in both oral and written forms.

The primary assignment for the course will be a semester-long research project. Because it is *actual research*, for which results cannot be known in advance, assessment of the research project will be based on constructive effort toward results and effective documentation of the work and process, rather than on the end results themselves.

In a typical class meeting, students will report on their current progress in their research project. Class meetings will also be time for making presentations to the group, for discussing topics of general relevance to the class, and for student research groups to work with me to help advance their research.

Class Meetings and Classroom Accountability

Discussion during class meetings is essential for the learning goals of this research-oriented course, and students are expected to be part of presenting progress on their research in class meetings. For this reason, class meeting attendance is exceptionally important; unexcused absences or excessive lack of attention during class meetings may result in a reduction of a student's Class Participation grade. Class Participation can take many forms, such as asking questions of peer presenters during class, discussing things with me in Office Hours that shape conversations during later class meetings, or other contributions that directly and constructively affect the conversations and interactions during class meetings. Students will not receive full credit for that part of the course grade without actively contributing to in-class discussions in some way. (If you have any questions about this as the semester goes along, please ask me!)

All students are responsible for **ALL** information given in class, whether or not it is presented in any other form (handout, course website, etc.). It is essential that students who miss a class meeting consult classmates and find out about any information—academic, administrative, or other—that they missed. There may be severe, unintended consequences for students who do not keep up with all information from class. It is your responsibility to see that this does not happen to you. The easiest way to ensure it: Attend every class meeting.

Homework Policies

It is exceptionally important in this research-oriented capstone course that assignments be completed on time. Many are due by the beginning of the class meeting in which they will be discussed, some are to enable me to look over your work before we discuss it in a class meeting, some are to make presentations in class meetings, etc., and lateness can substantially affect course meetings for *everyone* in the class. Please submit assignments on time!

For Small Assignments, grading will be on a ✓+ / ✓ / ✓− / 0 scale. If a Small Assignment is handed in up to 1 week late, there is a penalty of one “level” down; after that, there is a penalty of two “levels” down. The Research Project manuscript and video and the Final reflection assignment must be submitted on time; if late submissions are to be accepted, lateness penalties will be determined near the end of the semester, and they may be strictly enforced. And for any assignment, any lateness or lack of effort that negatively affects a class meeting will result in a deduction on the grade of that assignment.

These policies may be changed if administrative concerns demand it; if so, you will be given ample notice before the due date of any assignment affected by a Homework Policy change.

As with all CS446 policies, homework policies are intended to be fair to everyone involved in the course. They will be enforced fairly. Please feel free to ask me any questions about specific cases that may emerge over the semester!

Policy on Collaboration and Academic Integrity

Because CS446 is a research-oriented capstone course, the essential principles of the course collaboration / integrity policy are those of peer-reviewed research. Collaboration is welcome, and adopting and modifying ideas from outside sources is to be expected as part of your research! Your work (i.e., that of your research group), however, **must be entirely your own**. Give credit to others generously, whenever you think it might be appropriate: Do not use material (code, text, or figures) from any source without citing the source, claim research results you have not produced yourself, or knowingly make false statements. **As part of giving generous credit to others, on all assignments for CS446, please write down all sources of assistance, including everyone with whom you worked on the assignment.** Your “lab notebook” (see CS446’s first Small Assignment) is a great place to record sources or people consulted, as part of giving appropriate credit.

Colby’s “Avoiding Plagiarism” resource (<https://libguides.colby.edu/avoidingplagiarism>) lists examples of kinds of plagiarism; plagiarism is unacceptable in peer-reviewed research, and it is unacceptable in CS446.

Documentation of students’ research processes is essential for CS446 and part of the work on which grades are given; falsification of that documentation is considered plagiarism. Your professor reserves the right to ask students to verbally explain the reasoning behind their process or their work as part of determining a grade.

It is vitally important that you turn in work that is your own! Reports of academic dishonesty are handled by an academic review board and a finding of academic dishonesty may result in significant sanctions. For more details on Colby’s Academic Integrity policies and procedures, see <https://www.colby.edu/academicintegrity/>.

In general, the highest level of academic integrity is expected of every student in this class. If there are any questions about collaboration or related policies that come up over the semester, please come talk with me!

The Colby Affirmation

Colby College is a community dedicated to learning and committed to the growth and well-being of all its members.

As a community devoted to intellectual growth, we value academic integrity. We agree to take ownership of our academic work, to submit only work that is our own, to fully acknowledge the research and ideas of others in our work, and to abide by the instructions and regulations governing academic work established by the faculty.

As a community built on respect for ourselves, each other, and our physical environment, we recognize the diversity of people who have gathered here and that genuine inclusivity requires active, honest, and compassionate engagement with one another. We agree to respect each other, to honor community expectations, and to comply with College policies.

As a member of this community, I pledge to hold myself and others accountable to these values.

<https://www.colby.edu/catalogue/front-of-catalogue/colby-affirmation/>

Academic Accommodations *The following is standard suggested language regarding Academic Accommodations at Colby. It applies to this course.*

I am available to discuss academic accommodations that any student with a documented disability may require. Please note that you'll need to provide a letter from the Dean of Studies Office documenting your approved accommodations. *Please meet with me within two weeks of the start of the semester to make a request for accommodations* so that we can work together with the College to make the appropriate arrangements for you. Kate McLaughlin, Associate Director of Access and Disability Services (kmclaugh@colby.edu), is the primary contact for accommodations and any questions related to educational testing and documentation.

Mental health: I care about our students' well-being and understand they may face mental health challenges. Students are encouraged to seek support from the College's available resources, including your advising dean and Counseling Services. (For immediate care, please call 207-859-4490 and press "0" to reach the on-call counselor.) I am willing to discuss reasonable accommodations during a crisis, but to fulfill our educational mission, students are expected to adhere to the attendance policy. Failure to do so because of mental health challenges may require consultation with the Dean of Studies Office.

Religious Holidays *The following is standard suggested language regarding Religious Holidays at Colby. It applies to this course.*

Colby College supports the religious practices of students, faculty, and staff. Students are expected to notify their instructors of their intent to fulfill the obligations of their religious tradition well in advance of these days. For this class I ask that you notify me by e-mail at least 14 days in advance of the date in question.