

CS 4330/5330

Methods of Computer Science

Summer 2023

General Information

Class Website: <http://www.cs.uni.edu/~schafer/cohort22/Methods/>

Credit Hours: Three (3). This course meets the Course Credit Hour Expectation outlined in the UNI Course Catalog. Since this course is an "8-week" summer course, students should expect to average 15-20 hours per week on this course. [Each "summer week" approximates two "semester weeks" of content].

Instructor: Ben Schafer
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Course Information:

Course Catalog Description

Students will learn effective strategies for teaching computer science. Students will develop a project, either in a classroom or during an after-school or similar experience that seeks to teach a section of the CS standards targeted at the student population with which they are working. Projects should stress inclusivity and appeal to a diverse group of students.

Course Philosophy/Design

This course is designed to:

- provide teachers with pedagogical and content knowledge and experiences to be effective computer science teachers in high school.
- support computer science teachers in understanding computer science instruction such that they are comfortable designing instruction for their own students.
- explore/consider effective strategies for teaching and retaining students who are diverse learners. This includes planning instruction for active learning and problem-solving contexts.
- inform teachers about current Iowa/CSTA teaching standards so they are aware of what leaders in this community hope students will know and be able to do by the end of their K-12 education.
- provide teachers with experiences planning for appropriate feedback and assessments to measure student progress and use that information to inform next steps with individual students.

Course Outcomes

Upon completion of this course, participants should be able to:

- Use the national high school computer science model curriculum; analyze potential learning difficulties and plan teaching for students with different needs.
- Describe a variety of instructional outcomes included in middle and high school computer science.
- Describe a variety of methods in the teaching process, including meaningful learning, collaborative learning, inquiry learning, etc. as well as identify the CS instructional outcomes for which each is useful
- For a variety of general CS topics/areas (e.g., programming; the internet—operation and society; computer & system operation and society; data collection, analysis, and society; artificial intelligence and society) propose:
 - Appropriate student outcomes
 - Assessments for each outcome
 - Appropriate learning activities for each outcome
 - Mechanisms for providing student feedback
 - A grading process for the topic/area and its fit into overall course grading
- Describe a reasonable instructional environment for computer science and its utilization for a variety of CS content in middle and high school.

- Establish a bank of resources for teaching computer science in high school, including possible materials, lab assignments, class activities, and websites.
- Actively participate in professional communities such as CSTA and ACM. Keep up with research in the area of computer science education, and apply it to the teaching process.

Course Grading

[Note: The following is my intentions regarding how I will be grading/evaluating your work and assigning final grades. However, in an effort to be responsive to your needs I reserve the right to modify the structure of this course as we are in progress. If there is significant deviation from the policies described below the new policy will be openly and clearly discussed with you and in a timeframe that gives you a time to plan accordingly.]

You will earn a total of eight (8) "competency scores" over the eight weeks of this course. Each competency score will be a value from 1-4 based on the following assessment:

Score	Meaning
1	You submitted the deliverables or attempted the activity but you show little understanding of the standards of the activity. [NOTE, you cannot pass this course (grade of C or higher) with any 1s in your grades]
2	You have made significant progress towards demonstrating competency but there are limited items that remain unsatisfied.
3	You have "met" the standards of the activity. [You have displayed minimum acceptable competency on this activity.]
4	You have "exceeded" the standards of the activity. [You have met the standards of competency and shown considerable understanding/knowledge of the material.

The 8 scores used to determine your grade consist of the following activities:

- Two (2) Competency Demos (one each after Modules 1-2)
 - Competency Demos can be thought of as similar to tests/exams in other courses.
 - You will complete each competency demo within Blackboard. In order to be eligible to attempt a competency demo you must first all of the "check point" writing activities from that module.
 - If you are unsatisfied with your grade on any competency demo, you may talk to me, restudy the material, and attempt a second version of the CD.
- One (1) Individual Instructional Design Deliverable
 - In Module 3, you will complete the beginnings of an Instructional Design document for a CS course of your selection.
 - You will have the opportunity to receive feedback on this deliverable and to resubmit for potential grade improvement.
- One (1) Group Instructional Design Deliverable
 - In the second half of the course, you will be creating a much more detailed course design product than the one created in Module 3.
 - You will have the opportunity to receive feedback on this deliverable and to resubmit for potential grade improvement.
- Four (4) Individual evaluation documents of your group's instructional design deliverable
 - You will complete four individual deliverables that allow you to reflect and expand on the work done in the Group project.
 - You will have the opportunity to receive feedback on this deliverable and to resubmit for potential grade improvement.

The following evaluation criteria are used to determine the final course grades

Grade	Criteria
A	All scores are 3 or 4 AND more 4s than 3s
B	All scores are 3 or 4 OR No more than two scores of 2 AND an overall average of 3.25 or higher
C	No more than two scores of 2 AND an overall average of 3.00 or higher
D	More (3s and 4s) than (1s and 2s).
F	Any situation not handled above.

Scholastic Conduct

You are responsible for being familiar with the University's Academic Ethics Policies:

<https://www.uni.edu/policies/301>

Copying from other students is expressly forbidden. Doing so on exams or assignments will be penalized every time it is discovered. The penalty can vary from zero credit for the copied items (first offense) up to a failing grade for the course. If an assignment makes you realize you do not understand the material, ask a fellow student a question designed to improve your understanding, *not* one designed to get the assignment done. Your final submission for assignments should be **individual, original** work unless otherwise specified. Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Failure to do so is plagiarism and will necessitate disciplinary action. In addition to the activities we can all agree are cheating (plagiarism, bringing notes to a closed book exam, etc), assisting or collaborating on cheating is cheating. Cheating can result in failing the course and/or more severe disciplinary actions. Remember: Discussing assignments is good. Copying code or answers is not.

Accessibility

The University of Northern Iowa (UNI) complies with the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act, and other applicable federal and state laws and regulations that prohibit discrimination on the basis of disability. To request accommodations please contact Student Accessibility Services (SAS), located at ITTC 007, for more information either at (319) 273-2677 or Email accessibility_services@uni.edu. Visit Student Accessibility Services (<https://sas.uni.edu/>) for additional information.