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Syllabus
CSED 4330/5330, Methods of Computer Science
Summer 2023

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Course Information

Time and Place: This course is being taught as a Guided Independent Study course and does not meet synchronously.

Instructor: Dr. Ben Schafer

Email: schafer@cs.uni.edu

Credit Hours: Three (3). This course meets the Credit Hour Expectations outlined in the Course Catalog. Students should expect to work approximately 2 hours per week outside of class for every course credit hour.

Class Websites:

- https://www.cs.uni.edu/~schafer/cohort3/Methods/ (most lesson materials)
- Blackboard (Grades and Competency Demos)

Textbook
No textbook adequately fits our needs. Instead, all required readings and other materials will be selected from legally available resources on the internet or from instructor produced materials.

Computer Use
Students in this course will rely heavily on the use of the computer. All of the learning materials and programming environments for this course are available from any computer with a web browser and internet access. You will need access to a computer with Internet access while off campus and when in the classroom. If you do not have access to a device for daily use, please reach out to me and we will discuss how you might check one out from the university.

Course 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.
- 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 for planning next.

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

How Student Performance Will Be Evaluated

Course Grading

I use a grading system drawn from "standards-based grading" and "grading for equity" (https://gradingforequity.org/). The main ideas behind this are:
- Your job, as a student, is to show me (sometimes multiple times) that you can meet the course outcomes
- My job, as the teacher, should be to make sure that you are given plenty of opportunities to learn and practice what you need to demonstrate the course outcomes.
- Your final grade in the class should indicate your ability to meet the course outcomes and, for the most part, nothing else.

I WANT you to succeed in the course and that means giving you multiple opportunities to show me that you have learned the necessary material. In most cases, if you can't do this the first time, you will be able to re-study and try again.

You will earn multiple "grades" in this course. Each of these is a category of understanding that, for simplicity, is recorded as a score from 1-4 with the following meaning:

Score	Meaning
1	UNASSESSABLE - You submitted deliverables for the standard but what you submitted shows little understanding of the standards of the activity.
2	NEEDS WORK - You have made significant progress towards demonstrating competency but there are limited items that remain unsatisfied.
3	SATISFACTORY - You have "met" the standards of the activity.
4	EXCELLENT - You have "exceeded" the standards of the activity. [You have met the standards of competency and shown considerable understanding/knowledge of the material.

While it might be tempting to view these categories as like GPA categories (which is also a 4-point scale) that is not the way they are used or interpreted.

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) 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) Course Design Project
    - In the second half of the course, you will be working to create a more course design document that is more detailed 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 instructional design deliverable
    - You will complete four deliverables that allow you to reflect and expand on the work done in the design project.
    - You will have the opportunity to receive feedback on this deliverable and to resubmit for potential grade improvement.

Final course grades will be determined using the following evaluation criteria.

Grade	Criteria
A	ALL scores are 3 or 4 and the majority are 4s
B	All scores are 3 or 4 and the majority are 3s
C	All scores are 2, 3, or 4 and the majority are 3s
D	All scores are 2, 3, or 4 and the majority are 2s
F	Any missing standards or scores of 1

In most situations, grades earned are straight letter grades – no plusses or minuses. This isn't as rough as it seems because you have multiple opportunities to meet each standard. My experience is that the above table is often an incredibly accurate representation of what people know about the course material.

However, there are situations where I may add a plus or a minus:
- If your final project is a grade lower than your overall course grade I reserve the right to add a minus to your grade.
- If your final project is a grade higher than your overall course grade I reserve the right to add a plus to your grade.
- If I feel there are specific and individual circumstances where "mathematically" you earned a grade slightly lower than I feel your overall competence has demonstrated than I reserve the right to add a plus to your grade.

Final Thoughts
If you are having trouble with a topic in the class please reach out to me early. Do not wait until the situation is out of control. I am very willing to help. However, I have to know you need and want that help.

Additional Policies and Statements
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 CDs 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 fine and even encouraged. 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. Students with disabilities experiencing a barrier to access should connect with Student Accessibility Services (SAS) to request accommodations. For more information about the accommodation process, please contact SAS at (319) 273-2677 Relay 711, accessibilityservices@uni.edu, or GIL 118. Additional information is also available at sas.uni.edu.

The Learning Center

The Learning Center @ Rod Library provides free tutoring for a variety of different areas (i.e. writing, math, science, business, Spanish, college reading and learning strategies). The Learning Center @ Rod Library is open for walk-in assistance Monday-Thursday 10am-10pm and is free of charge for all UNI students. If you are unavailable during normal tutoring hours, online tutoring is also available through Smarthinking. You will need your CATID and passphrase to gain access. To access the Smarthinking platform go to **https://tlc.uni.edu/online**. For more information, go to **https://tlc.uni.edu**, email **TheLearningCenter@uni.edu** , call 319-273-6023, or visit the TLC desk located on the main floor of Rod Library.

Free Speech

The University of Northern Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We encourage the free and responsible exchange of diverse ideas on our campus. The University is committed to open inquiry and the spirited and thoughtful debate of such ideas.

Office of Compliance and Equity Management
Non-discrimination in Employment or Education
Content in this class has the potential to be disturbing to some individuals based on life experiences. If you ever feel the need to step out of the classroom or decline participation in an activity, please request an alternative learning experience.

UNI Policy 13.02 Discrimination, Harassment, and Sexual Misconduct states: "The University is committed to providing a workplace and educational environment, as well as other benefits, programs, and activities, that are free from discrimination and harassment based on a protected class, as well as retaliation."

Policy 13.02 outlines prohibited conduct and reporting processes. All University employees who are aware of or witness discrimination, harassment, sexual misconduct, or retaliation are required to promptly report to the Title IX Officer or Title IX Deputy Coordinator.

- Title IX Officer Leah Gutknecht, Assistant to the President for Compliance and Equity Management, 117 Gilchrist, 319.273.2846, leah.gutknecht@uni.edu

- Title IX deputy coordinator: Christina Roybal, Sr. Associate Athletic Director Athletics Administration, North DOME 319.273.2556, christina.roybal@uni.edu

If you or someone you know has been harassed or assaulted, you can find the appropriate resources at safety.uni.edu and equity.uni.edu. Resources that provide free, confidential counseling are also detailed at safety.uni.edu.

For additional information, contact the Office of Compliance and Equity Management, 117 Gilchrist Hall, 273-2846, equity@uni.edu.