

**George Mason University
College of Education and Human Development
Secondary Education**

**SEED 676-001– Advanced Methods of
Teaching Computer Science in the Secondary School
3 Credits, Spring 2024**

Mondays, 4:30 – 7:10 pm, Thompson Hall Room L018, Fairfax Campus

Faculty

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Prerequisites/Corequisites

SEED 566 and SEED 522 are prerequisites. EDRD 619 is a corequisite.

University Catalog Course Description

Emphasizes learning processes for computer science (CS). Introduces national and state standards regarding content and methodologies for teaching CS. Examines instructional methods and materials in relation to secondary CS content, curriculum, and assessment. Note: School-based field experience required.

Course Overview

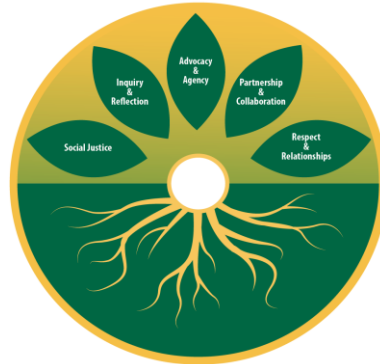
In *Teaching Computer Science in the Secondary School* course you thought about what it means to *understand* foundational CS content, were introduced to CS teaching methods, became familiar with standards documents, and learned about characteristics of CS instruction that foster deep understanding and proficiency in working with CS.

This course builds on students' knowledge from their first CS methods course. You will explore these aspects of teaching while keeping a focus on student thinking and learning. Regardless of whether a teacher is engaging with the class, differentiating instruction, or conducting an assessment, the teacher must focus on the development of student thinking about CS and a respect for student difference and diversity. You will learn how to do this in this class. This will help you as you embark upon internship and your first teaching position.

Course Delivery Method

All SEED classes have designated delivery modes and specific modes for each class session (e.g., face-to-face, virtual synchronous, virtual asynchronous). The majority of SEED classes are held in a face-to-face mode. **Students are expected to attend every class session in the mode that it is offered.** If you must miss a class session for illness or another valid reason, you are expected to proactively communicate (ahead of the class session) with your instructor about your expected absence. This course will be delivered using a lecture format; however, students are expected to come to class prepared and actively participate in discussions and other hands-on learning experiences.

The Secondary Education (SEED) Program “Seeds”



As illustrated by the model above, the SEED program is guided by five “Seeds” or principles that students are expected to understand and learn to apply in their teaching and professional lives: Social Justice, Inquiry and Reflection, Advocacy and Agency, Partnership and Collaboration, and Respect and Relationship. SEED students address each Seed in a developmental fashion, twice during their licensure program and once again during the master’s teacher research capstone experience:

- Each Seed is introduced and students demonstrate initial understandings and consider initial applications to teaching of the Seeds (as determined by the program and course instructor) during one of the five pre-licensure courses (“Foundations,” Methods I, Human Development, Methods II, Content Literacy)
- All five Seeds are revisited and students demonstrate deeper conceptual understandings of and identify applications to their teaching of the Seeds (in a manner they determine) during internship and internship seminar
- All five Seeds are explored more deeply, and students demonstrate mastery understandings of, applications to their teaching and teaching inquiries (via their teacher research Methodologies), and future integrations of the Seeds into their teaching and teaching inquiries (via their teacher research Discussions)

Course	Seed/Definition	Key Assignment Description
<p>“Foundations of Secondary Education”</p>	<p>“Advocacy and Agency” The SEED program educates teachers to develop a commitment to advocating for and developing agency in every young person. Teachers’ advocacy activities begin with pedagogical interactions and extend into school and community contexts. Similarly, teachers’ consideration of youths’ agency begins with enabling them to act independently and make choices in their own best interests—in the classroom and beyond.</p>	<p>Multi-Genre Blog The multi-genre blog is a collection of self-contained artifacts, representing multiple genres, united by a common theme. Each piece included in the collection must represent an aspect of the teacher candidate’s teaching philosophy, and be drawn from their research, clinical and life experience, and class discussions. The blog must demonstrate the teacher candidate’s understanding of why and how they will advocate for their students’ well-being and</p>

		success and help their students develop greater agency in school and beyond.
Methods I	<p style="text-align: center;">“Social Justice”</p> <p>The SEED program educates teachers to develop a commitment to social justice. Such a commitment encompasses the belief that all members of our school, university, and broader communities can contribute to disrupting inequitable interactions, practices, and structures, with a focus on enhancing each individual’s opportunity to learn and succeed. Social justice is also closely aligned with “equity,” which involves the implementation of anti-oppressive and antiracist interactions, practices, and structures that ensure that every individual has an unbiased, impartial, responsive, and appropriately-scaffolded opportunity for academic and professional success.</p>	<p style="text-align: center;">Lesson Plan</p> <p>Using a provided format, the lesson plan must include objectives, standards, instructional plans, assessments, classroom layout(s), a teacher script, and all materials that would be given to students as part of the lesson. The lesson must demonstrate the teacher candidate’s ability integrate justice concepts/content into their instruction.</p>
“Human Development and Learning”	<p style="text-align: center;">“Relationships with and Respect for Youth”</p> <p>The SEED program educates teachers to develop relationships with and respect for youths. When a school culture promotes respect, support for students’ identities, senses of belonging, and tolerance, students are able to work as active participants in the classroom and the community. Secondary teachers who create a welcoming environment in their classrooms; who strive to know and honor students’ backgrounds, preferences, and perspectives; who build relationships with young people based on trust and mutual understanding; and who connect curriculum to students’ cultures hold key to effective instruction. Their instruction will contribute to developing unique individuals who will be able to connect their life experiences to learning.</p>	<p style="text-align: center;">Case Study/Student Application Project</p> <p>The case study/student application project is a summative assessment of the teacher candidate’s ability to use psychological theory to analyze problems in a classroom and practice approaches a thoughtful, ethically principled teacher would use to solve problems. The case study/student applicant project must demonstrate the teacher candidate’s understanding of how and why teachers can use psychological theories and principles to develop relationships with and demonstrate respect for youths, with an ultimate goal of enhancing adolescents’ school and life success.</p>
Methods II	<p style="text-align: center;">Inquiry and Reflection</p> <p>The SEED program educates teachers who appreciate and know how to ask questions about their practices and who are critically reflective of their pedagogies, empowered by evidence. The ability to inquire and reflect on one’s teaching practice is foundational to educators’ ongoing and self-directed professional growth across their professional lifespans. Educators who can inquire into and consistently implement effective instructional practices--and who can critically reflect on and evaluate their pedagogies--will be the most responsive teachers and will best inspire students to learn.</p>	<p style="text-align: center;">Unit Plan/Lesson Implementation</p> <p>Teacher candidates will use the “backwards design” process to develop a plan for teaching a unit which actively involves students in meaningful learning; individualizes learning to accommodate the strengths and needs of students; and provides authentic assessments. Unit plans will include objectives, a calendar, and an outline of each day in the</p>

		<p>unit. One lesson of the unit must be taught/co-taught in the teacher candidate’s clinical experience classroom, and the unit plan and lesson implementation must demonstrate the candidate’s understanding of how and why teachers use of inquiry and reflection to improve their pedagogical practices and enhance student learning.</p>
<p>Content Literacy</p>	<p>“Collaboration and Partnership” The SEED program educates teachers who value collaborative engagement in learning and teaching and supporting collaboration through different forms of partnership. Collaboration takes on many forms, including collaboration amongst teacher candidates and their peers, course instructors and faculty advisors, mentor teachers in schools, their students and their students’ families and caregivers, and amongst experts in their fields of teaching. These collaborations occur through a shared understanding of partnership. By spanning multiple boundaries, the SEED program supports partnerships with local schools and their divisions, with state and national professional associations, and with international experiences in other countries.</p>	<p>Disciplinary Literacy Inquiry Project Teacher candidates complete an inquiry into methods of supporting students’ comprehension in their respective content areas. Using resources from class and peer-reviewed articles, candidates develop an understanding of how to guide and deepen students’ comprehension, addressing questions including “Why is it important to be literate in our respective subject areas?”. The inquiry project must demonstrate the candidate’s understanding of how why teachers collaborate with other education professionals, students, families and caregivers and others to support students’ subject area comprehension and literacy learning.</p>
<p>Internship and Internship Seminar</p>	<p>All SEED Seeds: Applications to Teaching All five Seeds are revisited and students demonstrate deeper conceptual understandings of and identify applications to their teaching of the Seeds during internship and internship seminar.</p>	
<p>Teacher Research (for Master’s students only)</p>	<p>All SEED Seeds: Applications to Teaching and Teaching Inquiries All five Seeds are explored more deeply, and students demonstrate mastery understandings of, applications to their teaching and teaching inquiries (via their teacher research Methodologies), and future integrations of the Seeds into their teaching and teaching inquiries (via their teacher research Discussions)</p>	

Learner Outcomes or Objectives



This course is designed to enable students to do the following:

1. Plan a unit of Computer Science instruction that includes elements of differentiation, assessment, is project-based, and requires students to engage in sense making while adhering to state and national standards
2. Develop assessments that give a teacher insight into student thinking about Computer Science content
3. Conduct an analysis of ideas for teaching Computer Science in diverse classrooms
4. Develop knowledge, skills, and professional behaviors across secondary settings, examine how Computer Science should be taught, and how students learn Computer Science; and observe and analyze a range of approaches to Computer Science teaching and learning focusing on tasks, environment, and assessment
5. Design and grade effective computer science assignments, including group projects.

Professional Standards

This course aligns to the professional standards as outlined by the Interstate Teacher Assessment and Support Consortium (INTASC), the Computer Science Teachers Association (CSTA). Upon completion of this course, students will have met certain elements the INTASC professional standards and [CSTA Standards for CS Teachers](#).

INTASC Standard 1. Learner Development

The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

INTASC Standard 6. Assessment

The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

INTASC Standard 7. Planning for Instruction

The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

CSTA Standard 1. CS Knowledge and Skills

Effective CS teachers demonstrate and continuously develop thorough knowledge of CS content. They demonstrate proficiency with the CS concepts of the grade bands they teach, and they integrate these concepts with CS practices, including computational thinking. They also understand the progression of content before and after the grade bands they teach. The current content expectations are maintained in student standards aligned to the K-12 CS Framework.

Indicators: Effective CS educators:

1a. Apply CS practices

Apply CS and computational thinking practices in flexible and appropriate ways. Practices include: Fostering an Inclusive Computing Culture, Collaborating Around Computing, Communicating About Computing, Recognizing and Defining Computational Problems, Developing and Using Abstractions, Creating Computational Artifacts, and Testing and Refining Computational Artifacts.

1b. Apply knowledge of computing systems

Apply knowledge of how hardware and software function to input, process, store, and output information within computing systems by analyzing interactions, designing projects, and troubleshooting problems.

1c. Model networks and the Internet

Model how computing devices connect via networks and the Internet to facilitate communication, and explain tradeoffs between usability and security.

1d. Use and analyze data

Collect, store, transform, and analyze digital data to better understand the world and make more accurate predictions.

1e. Develop programs and interpret algorithms

Design, implement, debug, and review programs in an iterative process using appropriate CS tools and technologies. Interpret algorithms, and explain tradeoffs associated with different algorithms.

1f. Analyze impacts of computing

Analyze how people influence computing through their behaviors, cultural norms, and social interactions, as well as how computing impacts society in both positive and negative ways.

CSTA Standard 2. CS Equity and Inclusion

Effective CS educators proactively advocate for equity and inclusion in the CS classroom. They reflect on an intentional equity-focused CS vision, and help reform the full pathway of student access, engagement, and achievement for all students in CS.

Indicators: Effective CS educators:

2a. Understand issues of equity in CS

Explain how structural barriers and social and psychological factors contribute to inequitable access, engagement, and achievement in CS among marginalized groups.

2b. Minimize threats to inclusion

Develop strategies to proactively challenge unconscious bias and minimize stereotype threat in CS.

2c. Represent diverse perspectives

Incorporate the perspectives and experiences of individuals from marginalized groups in curricular materials.

2d. Use data for decision-making to improve equity

Create and implement a plan to improve access, engagement, and full participation in CS using classroom data to inform decision-making.

2e. Promote accessible educational CS materials

Learn to effectively evaluate tools and curricula and to leverage resources to improve accessibility for all students.

CSTA Standard 3. Professional Growth and Identity

Effective CS educators continuously develop their knowledge, practice, and professional identity to keep pace with the rapidly evolving discipline. They participate in the larger CS education community and collaborate with others to develop the skills that enable all students to succeed in their classes.

Indicators: Effective CS educators:

3c. Identify and counteract personal bias

Reflect on how their own perspective, privilege, and power impact student success and classroom culture and continuously work to counteract these personal biases.

3d. Recognize the value of CS for all students

Refine a personal teaching philosophy reflecting that all students can and should learn CS.

3e. Leverage community resources

Identify and connect resources in the local community and broader CS ecosystem to support student learning in CS.

CSTA Standard 4. Instructional Design for CS

Effective CS educators design learning experiences that engage students in problem solving and creative expression through CS, using pedagogical content knowledge (PCK). They plan to meet the varied learning, cultural, linguistic, and motivational needs of individual students in order to build student self-efficacy and capacity in CS.

Indicators: Effective CS educators:

4c. Design inclusive learning experiences

Ensure that all students can access and engage with content and succeed in learning CS by using Universal Design for Learning (UDL) and Culturally Relevant Pedagogy (CRP).

4f. Inform instruction through assessment

Develop multiple forms of formative and summative assessment to provide feedback and support. Use resulting data for instructional decision-making and differentiation.

CSTA Standard 5. CS Classroom Practice

Effective CS teachers are responsive practitioners who implement applicable pedagogy to facilitate meaningful experiences and produce empowered learners of CS.

Indicators: Effective CS educators:

5a. Facilitate inquiry for student learning

Use inquiry-based learning to enhance student understanding of CS content.

5b. Cultivate a supportive classroom environment

Cultivate a supportive classroom environment that values and amplifies multiple solutions, approaches, perspectives, and voices.

5c. Promote student self-efficacy

Facilitate students' engagement in the learning process and encourage students to take leadership of their own learning by encouraging creativity and use of a variety of resources and problem-solving techniques.

5d. Support student collaboration with computing

Provide meaningful opportunities for students to work together. Elicit students' ability to provide, receive, and respond to constructive feedback.

5e. Encourage student communication about computing

Create meaningful opportunities for students to discuss, read, and write about computing.

5f. Provide meaningful feedback

Use formative assessments to provide effective feedback to students and to adjust instruction in order to promote stronger achievement in CS.

Required Texts

Access to the following materials is required:

Grover, S. (Ed). 2020. *Computer Science in K-12: An A-to-Z Handbook on Teaching Programming*. Edfinity.

Sentance, S., Barendsen, E., & Schulte, C. (Eds.). (2018). *Computer Science Education: Perspectives on Teaching and learning in school*. London, UK: Bloomsbury Publishing.

The Big Book of Computing Pedagogy. Raspberry Pi (2021). Retrieved from:
<https://helloworld.raspberrypi.org/issues/0>

The Big Book of Computing Content. Raspberry Pi (2022). Retrieved from:
https://helloworld.raspberrypi.org/books/big_book_of_computing_content

Virginia Standards of Learning for Computer Science. (2017). Retrieved from:
<https://www.doe.virginia.gov/teaching-learning-assessment/instruction/computer-science>

Computer Science Teachers Association. (2019). CSTA K-12 standards. Retrieved from
<https://www.csteachers.org/page/standards>

K-12 Computer Science Framework Steering Committee. (2016). K-12 computer science framework. ACM. Retrieved from <https://k12cs.org/wp-content/uploads/2016/09/K%E2%80%9312-Computer-Science-Framework.pdf>

Recommended Texts

Amy J. Ko, Anne Beitlers, Brett Wortzman, Matt Davidson, Alannah Oleson, Mara Kirdani-Ryan, Stefania Druga (2021). *Critically Conscious Computing: Methods for Secondary Education*. <https://criticallyconsciouscomputing.org/>, retrieved 01/01/2023.

Bergman, D. (2018). *Computer Science K-12: Imagining the possibilities!: Bringing creative and innovative Computer Science to your school 1st Edition*. CreateSpace Independent Publishing Platform.

Hazzan, O., Lapidot, T., & Ragonis, N. (2015). *Guide to teaching computer science: An activity-based approach*. London, UK: Springer.

Margolis, J., Estrella, R., Goode, J., Holme, J. J., & Nao, K. (2010). *Stuck in the shallow end: Education, race, and computing*. MIT press.

Margolis et al. (2010) can be accessed through Mason libraries. The link is: <https://bit.ly/3nGMUHK> Scroll down to "Links: Electronic resource available..." and click on the link.

You will also complete additional readings as assigned. All additional readings will be uploaded to Blackboard.

Teaching & Learning in 2024 (Written by Torrey Trust)

Learning isn't easy. Learning in the midst of a global pandemic, climate change and increasing natural disasters, mass shootings, political and social upheaval, and civil rights movements, can seem impossible at times. I understand that there may be days/hours/moments where you don't feel like learning or engaging in class. I hope that you can find the courage to communicate this with me. I am committed to providing a learning experience that is inclusive, flexible, and meaningful. I need you to commit to prioritizing your well-being, asking for help and accommodations to support your learning, and being willing to have tough conversations in class (and with others outside of class) about how we, as a society, can collectively repair, heal, learn together, and move toward a more equitable and hopeful future.

Guidelines for Success in SEED 676 (Written by Carey Dimmitt)

- Attend every class. Be on time.
- Come to class prepared, having completed homework.
- Take responsibility for the success of the class – this is up to all of us. Be an active presence, both listening and conversing. Make this a challenging experience in the best of that word. Challenge yourselves. Challenge each other. Challenge me.
- Respect everyone in the room. Be open to new ideas.
- Have a good attitude. We're not always in control of what happens to us. We are in control of our response to it.
- Remember that learning is constant, and forgive yourself for what you don't yet know and can't yet do.
- Communicate. If you have questions, ask them (truly there are no bad ones).
- Get to know each other. Get to know me. Let me get to know you.
- Allow yourself to grow as a person and as a teacher, even if the process isn't always comfortable or easy. Become as self-aware as possible, with pride in your strengths and compassion for your weaknesses.
- Be as honest as possible with each other and yourself, in a gentle way.
- Your self-care and self-compassion are as important as your care and compassion for others.
- Please communicate with me privately (after class or by appointment) if you have any questions or concerns about the course.

COURSE ASSIGNMENTS AND EXPECTATIONS

The following assignments will help you (and me) to gauge your development throughout the course:

Assignment	Percentage of Grade Graduate
In-Class Participation and Preparation	20%
Create Project	15%
Research Review	10%
Micro-Teaching and Reflection	15%
Field Experience Paper	15%
Unit Plan	20%
Computer Science Advocacy Action Plan	15%
Total	110%

PLEASE USE THE ASSIGNMENT INSTRUCTIONS THAT ARE POSTED ON BLACKBOARD – THE INSTRUCTIONS GIVEN ON THE SYLLABUS ARE FOR DESCRIPTIVE PURPOSES ONLY

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., VIA, hard copy).

Participation and Preparation

The participation of each class member is vitally important. If you do not come prepared to discuss the readings, to share your work on a given assignment, and to participate in the activities of the day the entire class will suffer. You **must** commit to coming to every class on time, being prepared for the evening's activities, and being ready to participate. You can expect that, in addition to work on the larger projects outlined below, there will be weekly readings and assignments that will fall into this category. If, however, there is an emergency and you cannot make it to class, you **must email me ahead of time** and submit all assignments electronically before the end of class.

Assignment Descriptions

Unit Plan

Throughout this semester, you will explore many issues related to the teaching and learning of CS. In this culminating assignment, you will have the opportunity to use the knowledge, skills, and understandings you've gained in this and the previous semester in the creation of a complete unit of study. Within this unit plan, you will be asked to design lessons that pay attention to the use of technology, the development of student understanding of CS content, various standards documents, assessment of student understanding, and ways to differentiate instruction for diverse groups of learners. Rubric and assignment details provided on Blackboard.

Research Review:

For this assignment, identify three peer-reviewed research articles related to computer science teaching. Relevant articles can be found via Google Scholar (<http://scholar.google.com>) and/or

the Mason library search engine (<http://library.gmu.edu>). You will then write a review of the articles, including (1) a description of the research questions, participants, methodology, and measures, (2) a synopsis of the findings, and (3) a discussion of how the findings can/should influence your classroom practice. Be sure to provide APA citations for each article. Submit the assignment via Blackboard. Rubric and assignment details provided on Blackboard.

Microteaching and Reflection:

Research shows that the most effective teachers inform their practice by analyzing and reflecting on their teaching. Toward the end of the semester, you will teach a 50-minute lesson that you have designed with your partner(s). After teaching, you will submit a reflection about the experience via Blackboard. Rubric and assignment details provided on Blackboard.

Prior to the day of the lesson:

- Identify any resources you need to teach your lesson and put in a request for what you cannot obtain to determine if it is available. Please do this at least two (2) weeks prior to the day you teach to ensure materials will be available.

Day of the lesson:

- Give a one-minute overview in which you will describe to the class the setting of this lesson (subject, grade level, standards, and objectives).
- For the remainder of the time, you will engage your classmates in a CS lesson
- Be sure to conduct a **formative assessment** so you have data to determine whether or not students achieve the objectives.

After the lesson:

- Examine the formative assessments, summarizing the results and determining from this data whether the objectives were achieved.
- Write a 1-page paper that examines what happened during your lesson, focusing on how the activities might have influenced student learning (positively and negatively). The paper should be organized as follows:
 - Identify the assessments used during lesson to evaluate the lesson objectives. Describe the results of the assessments of these objectives (e.g., percentage of the students achieved each objective).
 - Examine the lesson in detail to determine what happened in the classroom that might have influenced the results of the assessments and what could be done to improve student achievement. Where/how could students think more deeply about the objective? Where/how could they be more explicit (either as a class or individually) about what they had learned before the assessment? Further, you should conduct a critical review of the assessment as to whether it is a valid measure of the lesson objectives. Use evidence from assessments to draw your conclusions about your lesson.
 - Examine the specific actions you undertook as a teacher (mannerisms, answering questions, etc.) and categorize these into those actions that might help with student learning and those that might hinder student learning. In each category, explain how it might influence student learning.

Field Experience Assignment

The purpose of the field experience is to provide you with the opportunity to (1) connect the

goals of the course, CS education theories, and research findings to classroom/school practice, (2) be exposed to a variety of classroom/school communities, and (3) promote critical, self-reflection about your future teaching practice.

In this course you will spend 30 hours in area classroom(s) with teachers instructing subject(s) and grade level(s) for which you are being licensed. Many of these hours will be spent observing these teachers' instruction, but you will also be expected to engage with students individually, in small groups, and in whole groups, as your mentor teacher determines. As part of this experience, you will be reflecting on how teachers design instruction to meet the needs of students and you will consider suggestions as to how you might do things similarly and/or differently.

You should spend a minimum of 10 days observing teachers, with each day being a maximum of 3 hours. The purpose of the field experience is to provide you with the opportunity to (1) connect the goals of your Methods II class, education theories relevant to your subject matter, and concepts and research findings related to classroom/school practice, (2) study and begin to develop your pedagogical practices in a variety of classroom/school communities, and (3) promote critical, self-reflection about your current and future teaching practices.

Your **Clinical Experience Summary Project** should address all of the elements described on the **Clinical Experience Observation Protocol and Critical Incidents Reflection Form**:

1. your class's demographics
2. your classroom's layout and the teacher and student movements and interactions it enables or inhibits
3. your observations regarding your mentor teacher's and classroom's:
 - a. teaching processes and practices
 - b. student-teacher interactions
 - c. student-student interactions
 - d. teaching and learning with technology
 - e. interactions with students with special needs
 - f. interactions with diverse populations (e.g., multilingual students or underrepresented racial/ethnic minority students)
4. critical teaching/learning incidents
5. burning issues/questions
6. "best practice" teaching tips

Consider your Protocol and Reflection Forms as well as any other relevant data you collected and prepare your Clinical Experience Summary and Analysis Project. This report will be submitted through Blackboard and consists of 4-5 page description and analysis of what you have learned. Be sure to reflect on the intersections and tensions between what you have encountered in our Methods I and II classes, our course readings and activities, your own school experiences in similar classes, and your clinical experience observations. Finally, detail implications of this clinical experience, what you observed, and your analyses for your future teaching practices.

Note: Be sure to provide the Methods II Clinical Experience Introductory Letter to your mentor teacher, and discuss expectation for hours, Observation Protocol elements, Reflection Form

content, and this Summary and Analysis Project with your mentor teacher early in your clinical experience. Rubric and assignment details provided on Blackboard.

Create Performance Task

Programming is a collaborative and creative process that brings ideas to life through the development of software. In the Create performance task, you will design and implement a program that might solve a problem, enable innovation, explore personal interests, or express creativity. Your submission must include the elements listed in the Submission Requirements below:

General Requirements:

- Final Program Code
- A video that displays the running of your program and demonstrates functionality you developed
- Written responses to all the prompts in the performance task

Rubric and assignment details provided on Blackboard. This assignment was adapted from the College Board. Please see AP CS Principles Hand-out for more details (<https://apcentral.collegeboard.org/pdf/ap-csp-student-task-directions.pdf>)

CS Advocacy Action Plan

The Advocacy Action Plan is intended to help you outline actionable steps to move towards your goals for your CS program. You will begin the process of defining how you can advocate for more, comprehensive and equitable CS education. In this assignment, you will be plotting your course of action with objectives, strategies, and timelines. Rubric and assignment details provided on Blackboard.

Grading

High quality work and participation is expected on all assignments and in class. Attendance at all classes for the entire class is a course expectation. For each unexcused absence, the course grade will be reduced by 5% points. All assignments are graded and are due at the beginning of class on the day they are due. Late assignments will automatically receive a ten percent grade reduction (one full letter grade lower).

A = 95-100%;
 A- = 90-94%;
 B+ = 87-89%;
 B = 83-86%;
 B- = 80-82%;
 C = 70-79%;
 F = Below 70%

Use of Generative-Artificial Intelligence (AI) Tools

Use of Generative-AI tools should be used following the fundamental principles of the Honor Code. This includes being honest about the use of these tools for submitted work and including citations when using the work of others, whether individual people or Generative-AI tools.

When explicitly stated by the instructor, Generative-AI tools are allowed on the named assignment. Students will be directed if and when citation or statement-of-usage direction is

required. Use of these tools on any assignment not specified will be considered a violation of the academic integrity policy. All academic integrity violations will be reported to the office of Academic Integrity. Some student work may be analyzed using an originality detection tool focused on AI tools. Generative AI detection tool use will be revealed when the assignment directions are provided to students.

Attendance Policy

1. In accordance with the GMU Attendance Policies (University Catalog, 2023-2024), “Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation may be a factor in grading, instructors may use absence, tardiness, early departure, or failure to engage in online classes as de facto evidence of nonparticipation.” See <https://catalog.gmu.edu/policies/academic/registration-attendance/#ap-1-6>.
2. If you must be absent from class, inform the instructor prior to the beginning of the class session. Missed classes (or portions of classes) will result in loss of participation points. Unless there are extenuating circumstances that have been shared with the instructor, more than two missed classes will result in a failing grade, and you must retake the course if you wish to earn credit.
3. Absence from class to observe a religious holiday, to serve jury duty, or to participate in required military service are exemptions to the above policy. If you anticipate being absent for any of these reasons, please make arrangements at least 48 hours in advance. See <https://catalog.gmu.edu/policies/academic/registration-attendance/#ap-1-6-1>
4. In addition, **you are expected to be on time to class** each week unless 48 hours advance notice has been provided to the instructor.

Class Schedule

Note: This schedule serves as a roadmap for the course. Faculty reserves the right to alter the schedule as necessary, with notification to students. No assignment will ever be moved up in the calendar, but assignments may need to be pushed back based on the pacing of the course.

Date	Topic	Text	Activity or Assignment Due
Week 1 (Jan 22)	Staging the Big Picture: Course Goals		
Week 2 (Jan 29)	Scaling Inclusive Pedagogy: Who’s in the Room? Use- Modify – Create and PRIMM	See BlackBoard Announcements	Research Review Assignment Introduction

<p>Week 3 (Feb 5)</p>	<p>Backwards Design, and Unit Plans</p> <p>Scaling Inclusive Pedagogy: Who's in the Room? (Part 2)</p>	<p>See BlackBoard Announcements</p>	<p>Selection of Unit Plan Topic</p>
<p>Week 4 (Feb 12)</p>	<p>Scaling Inclusive Pedagogy: Why should you care?</p> <p>AP CS Principles</p> <p>Create Task Assignment Introduction</p>	<p>See BlackBoard Announcements</p>	<p>Introduction to Create Task</p>
<p>Week 5 (Feb 19)</p>	<p>No Class - President's Day</p>		
<p>Week 6 (Feb 26)</p>	<p>Scaling Inclusive Pedagogy: How do they learn?</p> <p>Computing Systems</p> <p>Peer Instruction, Worked Examples, Subgoal Labeling, and Live Coding</p>		
<p>Week 7 Spring Recess (March 4)</p>	<p>No Class – Spring Break</p>		
<p>Week 8 (March 11)</p>	<p>Scaling Inclusive Pedagogy: How can we make an impact?</p> <p>Physical Computing</p>	<p>See BlackBoard Announcements</p>	
<p>Week 9 (March 18)</p>	<p>Identifying Student Misconceptions</p> <p>Scaling Inclusive Pedagogy: How to advocate for CS in your school?</p>	<p>See BlackBoard Announcements</p>	<p>Due Date: Research Review Assignment</p>

	Computer Science Advocacy Action Plan Assignment		
Week 10 (March 25)	Assessment Cybersecurity Education UDL	See BlackBoard Announcements	Due Date: Create Task
Week 11 (April 1)	Data Science in K-12 CS Education Professional Learning Networks: Being a Member of the Computer Science Education Community	See BlackBoard Announcements	Due Date: Advocacy Action Plan
Week 12 (April 8)	Work on Unit plans – no class		Submit initial unit plan
Week 13 (April 15)	Unit plans – Peer Review	See BlackBoard Announcements	
Week 14 (April 22)	Microteaching		Due Date: Field Experience
Week 15 (April 29)	Microteaching		Due Date: Microteaching Reflection
Week 16 (May 6)	No CLASS – Remaining assignments due Reading Day(s)		Due Date: Unit Plan Project

Field Experience Signup

Per state guidelines, you are required to complete 30 hours of fieldwork during this class. For more information about field placement, go to <https://cehd.gmu.edu/epo/field-experience>. Additionally, please answer the survey sent by Ms. Lisa Green. If you have missed this survey, go to <http://cehd.gmu.edu/endorse/ferf> to sign up for your placement.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. See <https://cehd.gmu.edu/students/policies-procedures/>

GMU Policies and Resources for Students

Policies

- a. Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/>).
- b. Students must follow the university policy for Responsible Use of Computing (see <https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- c. Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- d. Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <https://ds.gmu.edu>).
- e. Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

1. Support for submission of assignments to VIA should be directed to viahelp@gmu.edu or <https://cehd.gmu.edu/aero/assessments>. Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking: As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at [703-380-1434](tel:703-380-1434) or Counseling and Psychological Services (CAPS) at [703-993-2380](tel:703-993-2380). You may also seek assistance from Mason’s Title IX Coordinator by calling [703-993-8730](tel:703-993-8730), or emailing titleix@gmu.edu.

For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

For additional information on the College of Education and Human Development, please visit our website <http://cehd.gmu.edu/>.

COLLEGE EXPECTATIONS AND UNIVERSITY HONOR CODE

- Students are expected to exhibit professional behaviors and dispositions at all times. See **Graduate School of Education Dispositions for A Career Educator** section below and follow the instructions.
- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/honor-code/>].
 - Please note the following.
 - “Plagiarism encompasses the following:
 - Presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgment.
 - Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgment.” (from Mason Honor Code online at <http://mason.gmu.edu/~montecin/plagiarism.htm>)
 - Paraphrasing involves taking someone else’s ideas and putting them in your own words. When you paraphrase, you need to cite the source using APA format.
 - When material is copied word for word from a source, it is a direct quotation. You must use quotation marks (or block indent the text) and cite the source.
 - Electronic tools (e.g., SafeAssign) may be used to detect plagiarism if necessary.
 - Plagiarism and other forms of academic misconduct are treated seriously and may result in disciplinary actions
- Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>]
- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. **All communication from the university, college, school, and program will be sent to students solely through their Mason email account.**
- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu/>].
- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See <http://writingcenter.gmu.edu/>].
- The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles. <http://cehd.gmu.edu/values/>

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See <http://gse.gmu.edu/>].

Graduate School of Education Dispositions for A Career Educator

Students are expected to exhibit professional behavior and dispositions. The Virginia Department of Education and the National Council for Accreditation of Teacher Education promote standards of professional competence and dispositions. Dispositions are values, commitments, and professional ethics that influence behaviors toward students, families, colleagues, and all members of the learning community. The Graduate School of Education expects students, faculty, and staff to exhibit professional dispositions through a:

I. Commitment to the profession

- Promoting exemplary practice
- Excellence in teaching and learning
- Advancing the profession
- Engagement in partnerships

II. Commitment to honoring professional ethical standards

- Fairness
- Honesty
- Integrity
- Trustworthiness
- Confidentiality
- Respect for colleagues and students

III. Commitment to key elements of professional practice

- Belief that all individuals have the potential for growth and learning
- Persistence in helping individuals succeed
- High standards
- Safe and supportive learning environments
- Systematic planning
- Intrinsic motivation
- Reciprocal, active learning
- Continuous, integrated assessment
- Critical thinking
- Thoughtful, responsive listening
- Active, supportive interactions
- Technology-supported learning
- Research-based practice
- Respect for diverse talents, abilities, and perspectives
- Authentic and relevant learning

IV. Commitment to being a member of a learning community

- Professional dialogue
- Self-improvement
- Collective improvement
- Reflective practice
- Responsibility

- Flexibility
- Collaboration
- Continuous, lifelong learning

V. Commitment to democratic values and social justice

- Understanding systemic issues that prevent full participation
- Awareness of practices that sustain unequal treatment or unequal voice
- Advocate for practices that promote equity and access
- Respects the opinion and dignity of others
- Sensitive to community and cultural norms
- Appreciates and integrates multiple perspectives

IMPORTANT INFORMATION FOR LICENSURE COMPLETION

Student Clinical Practice: Internship Requirements

Testing

Beginning with Spring 2015 internships, all official and passing test scores must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the internship application deadline. Allow a minimum of six weeks for official test scores to arrive at Mason. Testing too close to the application deadline means scores will not arrive in time and the internship application will not be accepted.

Required tests:

- Praxis Core Academic Skills for Educators Tests (or qualifying substitute)
- VCLA
- Praxis II (Content Knowledge exam in your specific endorsement area)

For details, please check <http://cehd.gmu.edu/teacher/test/>

Endorsements

Please note that ALL endorsement coursework must be completed, with all transcripts submitted and approved by the CEHD Endorsement Office, prior to the internship application deadline. Since the internship application must be submitted in the semester prior to the actual internship, please make an appointment to meet with the Endorsement Specialist and plan the completion of your Endorsements accordingly.

CPR/AED/First Aid

Beginning with spring 2015 internships, verification that the Emergency First Aid, CPR, and Use of AED Certification or Training requirement must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the application deadline. Students must submit one of the "acceptable evidence" documents listed at <http://cehd.gmu.edu/teacher/emergency-first-aid> to CEHD Student and Academic Affairs. In order to have the requirement reflected as met in the Mason system, documents can be scanned/e-mailed to CEHDacad@gmu.edu or dropped-off in Thompson Hall, Suite 2300.

Background Checks/Fingerprints

All local school systems require students to complete a criminal background check through their human resources office (not through George Mason University) **prior to beginning the internship**. Detailed instructions on the process will be sent to the student from either the school system or Mason. Students **are strongly advised** to disclose any/all legal incidents that may appear on their records. The consequence of failing to do so, whether or not such incidents resulted in conviction, is termination of the internship.

Please Note: Your G-Number must be clearly noted (visible and legible) on the face of the document(s) that you submit.

Application

The internship application can be downloaded at <http://cehd.gmu.edu/teacher/internships-field-experience>

Deadlines:

Spring internship application:

- Traditional: September 15
- On-the Job: November 1

Fall internship application:

- Traditional: February 15
- On-the Job: May 1