

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

**SEED 566-001 – Teaching Computer Science in Secondary School
3 Credits, Fall 2023
Mondays, 4:30 – 7:10 pm, Thompson Hall Room L018, Fairfax Campus**

Faculty

Name: Erdogan Kaya, PhD
Office Hours: Thompson Hall 2400B by appointment
Office Phone: 703-993-1033
Email Address: ekaya3@gmu.edu

Prerequisites/Corequisites

There are no prerequisites. SEED 540 is a recommended corequisite.

University Catalog Course Description

Emphasizes developing different styles of teaching and covers curricula, current issues, and research literature in secondary school computer science. Note: School-based field experience required.

Course Overview

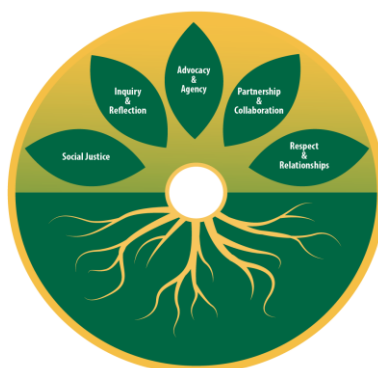
This course is designed to provide potential computer science (CS) teachers with an understanding of general and specific methods for teaching CS in middle and high school. Students will examine a variety of computing tools, virtual environments, and a variety of other resources to support the teaching of CS. Effective pedagogical strategies for curriculum design, assessments, differentiation, and classroom management will be addressed.

Course Delivery Method

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.

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 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.

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</p>

		teacher candidate’s understanding of why and how they will advocate for their students’ well-being and 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</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</p>

	the most responsive teachers and will best inspire students to learn.	will include objectives, a calendar, and an outline of each day in the 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 inquiry and reflection to improve their pedagogical practices and enhance student learning.
Content Literacy	<p align="center">“Collaboration and Partnership”</p> <p>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 align="center">Disciplinary Literacy Inquiry Project</p> <p>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>
Internship and Internship Seminar	<p>All SEED Seeds: Applications to Teaching</p> <p>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>	
Teacher Research (for Master's students only)	<p>All SEED Seeds: Applications to Teaching and Teaching Inquiries</p> <p>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

1. Demonstrate an ability to plan a CS lesson that fosters deep understanding of CS content for *all* students

2. Plan a CS lesson that includes elements of differentiation, assessment, is problem-based, and requires students to engage in sense making while adhering to state and national standards
3. Demonstrate pedagogical content knowledge (i.e., how to teach CS concepts), as well as practical experience, to be an effective CS teacher at the secondary school level.

Professional Standards

This course aligns to the professional standards as outlined by the Computer Science Teachers Association (CSTA) and the International Society for Technology in Education (ISTE). Upon completion of this course, students will have met certain elements of the INTASC standards 1, 3, 4, 5, 6, 7, 8, 9 and the CSTA/ISTE professional standards 1, 2, 3, 4, and 5.

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 3. Learning Environments

The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

INTASC Standard 4. Content Knowledge

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

INTASC Standard 5. Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

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.

INTASC Standard 8. Instructional Strategies

The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

INTASC Standard 9. Professional Learning and Ethical Practice

The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

CSTA/ISTE Standard 1. CS Knowledge & Skills

Effective computer science educators develop thorough knowledge of the CS concepts and practices that underlie what they teach. They demonstrate proficiency with CS concepts for the relevant grade band and familiarity with preceding and following grade bands. They engage in computational thinking themselves in order to support their students in developing these practices.

Indicators: Effective computer science educators:

1a. Understand computing systems

Understand how hardware and software work within systems to input, process, store, and output information.

1b. Understand networks and the Internet

Understand how computing devices connect via networks and the Internet to facilitate communication and foster innovation.

1c. Use and analyze data

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

1d. Develop programs and understand algorithms

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

1e. Analyze impacts of computing

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

1f. Demonstrate CS practices

Apply and model 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 & Using Abstractions, Creating Computational Artifacts, and Testing and Refining Computational Artifacts.

Standard 2. Equity and Inclusion

Effective CS teachers proactively advocate for equity and inclusion in the CS classroom. They work towards an intentional, equity-focused vision to improve access, engagement, and achievement for all of their students in CS.

Indicators: Effective computer science educators:

2a. Examine issues of equity in CS

Examine how systemic barriers and social and psychological factors contribute to inequitable access, engagement, and achievement in CS among marginalized groups. Reflect on how issues of equity manifest in their own CS teaching context.

2b. Minimize threats to inclusion

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

2c. Represent diverse perspectives

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

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. Use accessible instructional materials

Evaluate tools and curricula and leverage resources to improve accessibility for all students.

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 computer science 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.

CSTA/ISTE Standard 4. Instructional Design for CS

Effective computer science 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 computer science educators:

4a. Analyze computer science curricula

Analyze computer science curricula for implementation in their classrooms in terms of CS standards alignment, accuracy, completeness of content, cultural relevance, instructional approaches, and accessibility.

4b. Develop standards-aligned learning experiences

Design and adapt learning experiences with strong alignment to comprehensive K-12 computer science standards.

4d. Develop strong student conceptual understanding

Use a toolkit of CS-specific teaching strategies to develop students' strong conceptual understanding and to proactively address student misconceptions in CS.

4e. Integrate personally meaningful projects

Plan opportunities for students to create open-ended and personally meaningful projects.

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.

4g. Build connections between CS and other disciplines

Design learning experiences that highlight connections to other disciplines and real-world contexts

CSTA/ISTE Standard 5. CS Classroom Practice

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

Indicators: Effective computer science 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.

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.

Krauss, J., & Prottsman, K. (2016). *Computational thinking and coding for every student: The teacher's getting-started guide*. Corwin Press.

The Big Book of Computing Pedagogy. Raspberry Pi (2021). Retrieved from:

<https://helloworld.raspberrypi.org/issues/0>

Virginia Standards of Learning for Computer Science. (2017). Retrieved from:

http://www.doe.virginia.gov/testing/sol/standards_docs/computer-science/index.shtml

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 8/6/2022.

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.

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard or VIA). Hard copies of materials are NOT accepted.

Assignments and/or Examinations

The following assignments will help us to gauge your development throughout the course:

Assessment	Percentage of Grade (Graduate)
Participation and Preparation (including weekly assignments and readings)	20%
Lesson Plan Assignment	20%
Microteaching and Reflection	20%
Field Work Assignments	20%
CS Integration Task	20%

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

Lesson Plan Assignment

Throughout the 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 have gained in the creation of a lesson plan. Within this lesson, you will attend to the development of student understanding of CS content, various standards documents, and problem-based instruction.

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 30-minute lesson that you

have designed with your partner(s). After teaching, you will submit a reflection about the experience via 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 Work Assignments

One of the most valuable pieces of pre-service teacher training is the opportunity to do field work. You will **complete 15** hours of field work and keep a log of these hours for submission at the end of the semester. Throughout the semester, you will be required to complete smaller assignments during your field work. These assignments provide you with opportunities to reflect upon the practice of teaching after having watched instances of teaching in real world settings.

CS Integration Task

Computational thinking is a problem-solving method that can be applied to any discipline. Integrating this kind of thinking into the curriculum is essential. For this assignment, you will develop a task that integrates CT/CS that would typically be taught in one of the four core subject areas (English, Mathematics, Social Studies, Science), or other subjects such as World Language, Physical Education, or Fine Arts Education.

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 quality of the class suffers. 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.

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%

If circumstances warrant, a written contract (there is a form that CEHD provides) for an incomplete must be provided to the instructor for approval prior to the course final examination date. Requests are accepted at the instructor's discretion, provided your reasons are justified and that 80% of your work has already been completed. Your written request should be regarded as a contract between you and the instructor and must specify the date for completion of work. This date must be at least two weeks prior to the university deadline for changing incompletes to letter grades.

Professional Dispositions

See <https://cehd.gmu.edu/students/policies-procedures/>

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/>.

GMU Policies and Resources for Students

Policies

1. Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/>).
2. Students must follow the university policy for Responsible Use of Computing (see <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
3. 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.
4. 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 <http://ods.gmu.edu/>).
5. Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

6. 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/>.
7. 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/>.

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

Class Schedule

Note: Faculty reserves the right to alter the schedule as necessary, with adequate notification to students. The dates of assignments are subject to change dependent on the progress of the course. I will not move due dates for major assignments to an earlier date, only a later date if necessary. Additional smaller assignments and readings may be made each week. Additionally, at times different students will read different readings and share their understandings with the class. All readings noted with “see Bb site” will be available on Blackboard at least a week before they are to be read for class.

Date	Topic	Readings	Assignment Due
Week 1 (Aug 21)	Course Introduction		
Week 2 (Aug 28)	Overview of the Discipline of CS Why teach computer science? Social Justice	See BlackBoard Announcements	
Week 3 (Sept 4)	No Class – Labor Day Holiday		
Week 4 (Sept 11)	CS Standards <ul style="list-style-type: none"> • VA SOL • CSTA K-12 Standards Pair Programming	See BlackBoard Announcements **Download SOL and CSTA Standards and Framework	
Week 5 (Sept 18)	Lesson Plans Backward Design	See BlackBoard Announcements	
Week 6 (Sept 25)	Computational Thinking (Part 1) Unplugged Approach – Part 1	See BlackBoard Announcements	
Week 7 (Oct 2)	Computational Thinking (Part 2) CS Across Subjects Unplugged Approach – Part 2	See BlackBoard Announcements	
Week 8 (Oct 9)	No Class – Fall Break		
Week 9 (Oct 16)	Identifying Student	See BlackBoard Announcements	At least 7 hours of field

	Misconceptions		work should be completed
Week 10 (Oct 23)	Formative and Summative Assessment Parsons Problems	See BlackBoard Announcements	
Week 11 (Oct 30)	Work on Lesson Plans No Class	See BlackBoard Announcements	CS Integration Assignment Due
Week 12 (Nov 6)	Work on Lesson Plans No Class	See BlackBoard Announcements	
Week 13 (Nov 13)	Microteaching	See BlackBoard Announcements	
Week 14 (Nov 20)	Microteaching	See BlackBoard Announcements	
Week 15 (Nov 27)	Peer Review of Lesson Plans		All field work completed with accompanying assignments and log sheet - Upload to Blackboard)
Week 16 (Dec 4)	No Class – complete and submit final assignments		Lesson Plan Assignment Due Microteaching Reflection Due

Assignment Rubrics

George Mason University
College of Education and Human Development

Secondary Education (SEED) Lesson Planning Assessment
Completed in Methods I

Assessment Information

In the Secondary Education (SEED) program, the Lesson Planning Assessment is completed during Methods I and is assessed by Methods I instructor. The candidate must earn a score of 2 to be successful on this assignment. If a candidate does not earn a 2 on the assignment, he/she must meet with the course instructor or assessor prior to resubmitting. The data from this assessment are used to identify both best practices and gaps in developing and assessing a specific lesson plan and the impact on student learning.

Standards Addressed in This Assessment

- Interstate Teacher Assessment and Support Consortium (InTASC) Standards: 1, 2, 3, 4, 5, 6, 7, 8, 9
- Virginia Department of Education (VDOE) Standards: 1, 2, 3, 4, 5, 7
- Council for the Accreditation of Educator Preparation (CAEP) Standards: 1.1 (InTASC Standards), 1.2 (Use of Research), 1.3 (Content and Pedagogical Knowledge), 1.4 (College and Career Readiness), 1.5 (Technology)
- CAEP Cross-Cutting Themes (CCT): Technology, Diversity

Assessment Objective

The candidate will develop a research-supported lesson plan that effectively meets the needs of a specific population of learners.

Rationale

It is important that teacher candidates demonstrate their ability to design an effective lesson plan with specific, performance-based learning objectives that meet the learning needs of their learners. Lesson planning can be guided by four basic questions (adapted from Spencer, 2003):

1. *Who are my learners?* (Consider the number of learners, their academic readiness levels and cultural backgrounds, their prior knowledge, etc.)
2. *What do I want my learners to learn?* (Consider the content or subject (and interdisciplinary connections), the type of learning (knowledge, skills, behaviors), how to integrate college- and career-ready standards, etc.)
3. *How will I know what the learners understand?* (Consider informal and formal assessments, formative and summative assessments, higher order questioning techniques, feedback from learners, etc.)
4. *How will my learners learn best?* (Consider the teaching models, learning strategies, length of time available, materials, technology resources, differentiation, modifications, etc.)

You might also want to ask:

- What knowledge, skills, and understandings do my learners already have?
- What knowledge or prerequisite skills do I need to access, activate, or build in this lesson? How will I access those prerequisite skills or activate that prior knowledge?
- Where have learners come from and what are they going on to next?
- How can I build in sufficient flexibility to respond to emergent needs indicated by ongoing observation and formative assessment?

During field experiences and the internship, a lesson plan must be developed for each teaching session. As a novice teacher, lesson plans are developed for each instructional episode (lesson, one-to-one instruction, and small group activity). When teaching new content or grade levels, your lesson plans will be more detailed. As you gain pedagogical content knowledge and are proficient, your lesson planning becomes less detailed. Part of the planning process includes considering the following tasks:

- List content and key concepts (research more if needed).
- Define your aims and identify specific learning objectives/goals/outcomes aligned to appropriate curriculum standards, Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and College- and Career-Ready standards.
- Create assessments that are aligned to your specific learning objectives/goals/outcomes.
- Think about the structure of the lesson, pacing, transitions, and use of technology.
- Identify the strengths and needs of all learners.
- Identify adaptations/modifications/extensions needed to meet learner needs.
- Determine “best practices” and learning strategies aligned to the learning objectives/goals/outcomes.
- Identify learning resources and support materials, including technology.

Directions for Completing this Assessment Task

Develop and teach a lesson plan using the template attached. Review the rubric to guide the development of your lesson plan.

Submission Directions

You will submit a detailed lesson plan (using the Lesson Plan Template) that addresses each of the sections described below.

Section 1: Classroom Context

Classroom decisions are made based upon your learners’ strengths and needs. Your plan may vary based upon when, in a unit of instruction, the lesson takes place, and even the time of the lesson. In this section, you will provide basic information about your learners and the classroom—including academic and cultural backgrounds and prior knowledge, and any assessments that will guide your planning. Make certain to address how your knowledge of your learners will affect your planning. (½–1 page)

Section 2: Planning for Instruction

Before you teach a lesson, you must decide the learning objectives/goals/outcomes and connection to Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and/or College- and Career-Ready standards you will use and why you have selected these objectives and specific

strategies to teach the lesson to your specific group of learners. You make these decisions based upon learner needs, current research, prior knowledge or pre-assessments of learning, aligned to appropriate curriculum standards. While planning your lesson, using your knowledge of your learners, you will make decisions as to the modification/differentiation and/or accommodations you will need to meet the needs of all learners in your classroom. Then, with an informed understanding of your audience and your content, identify the learning materials needed to teach the lesson and any technology you and/or your learners will use in this lesson. In this section, be sure to detail all of these planning elements, including how you will assess learner mastery of lesson content— using both formative and summative assessments throughout the lesson. Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and/or College- and Career-ready skills, and any content specific objectives should be included in lesson plans. (1–2 pages)

Section 3: Instruction and Assessment

After you have identified *what* your class will learn, you will begin to chart out specifically *how* you will teach the lesson. When completing this section of the lesson plan, you will identify the procedures that you will use from the opening of the lesson through the lesson closure. Script this section of the plan, noting what you will say and do and what you are asking learners to do. Be certain to include formative assessments and guided practice activities and any independent practice and summative assessments you will have learners complete. (2–3 pages)

Section 4: Reflection: Impact on Learning

John Dewey noted that without reflection, there is no learning. In this section, reflect upon the lesson and consider whether your learners were able to meet the learning objectives/goals/outcomes for the lesson (Dewey, 1933). How do you know learners were able to successfully meet the lesson objectives/goals/outcomes? (Be specific here and use formative/summative assessment results to guide your response.) What was your impact on learning? (That is, how did your instructional decisions seem to affect learning? Again, be specific.) What strategies or activities were the most successful? What could have made the lesson stronger? What did you learn about teaching, learners, and learning that will affect your next instructional experience? (1 page)

***NOTE:** Lesson plans will be evaluated based on adherence to the provided lesson plan format; consistency with instructional methods taught in the program; appropriate rationale provided; specification of objectives, as related to state and national standards; whether there was an appropriate match between the assessment of learning and learning objectives; coherence of writing, and mechanics. Additionally, plans should include the Virginia Standards of Learning (SOL), Aligned Standards of Learning (ASOL), College- and Career-Ready skills, and other content specific objectives.*

References

- Dewey, J. (1933). *How we think. A restatement of the relation of reflective thinking to the educative process* (Revised ed.). Boston: D. C. Heath and Company.
- Spencer, J. (2003). *Learning and teaching in the clinical environment*. London, England: BMJ Publishing Group.

Lesson Plan Template

Section 1. Classroom Context

Grade level:

Number of students:

Content Area:

Name of Unit:

Lesson planned for ____ minutes

Circle when this lesson occurs in the unit: _ beginning middle _end

Narrative including any additional contextual information that will impact planning:

Section 2. Planning for Instruction

Performance-based Objective(s)

National content standards and VA Standards of Learning (SOL)/Career- and College- Ready Standards

Lesson Rationale: What research base did you use to make instructional decisions? Why have you selected these objectives and these specific strategies?

Differentiation and Accommodations

Materials/Technology

Section 3. Instruction and Assessment

Instruction Context: Describe purpose of the lesson.

Lesson Procedures: Detail the sequence of the lesson, including the Opening/Strategies/Assessments/Closure activities. Note: The reader should be able to teach the lesson from this plan.

Assessments: Include explanation of assessment choices (formal/informal and formative/summative assessments) and alignment of assessments to lesson objectives.

Section 4. Reflection: Impact on Student Learning

Narrative reflection on the lesson and the impact on student learning. Include any changes you would make to the lesson based upon your reflection.

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

**Council for the Accreditation of Educator Preparation Common Assessment
Lesson Plan Rubric**

The target score for all Candidates is “Proficient,” Level 2. The Candidate must earn a score of 2 to be successful on this assignment. If a Candidate does not earn a 2 on the assignment, he/she must meet with the course instructor or assessor prior to resubmitting. The data from

this assessment are used to identify both best practice and gaps in developing and assessing a specific lesson plan and its impact on student learning.

GENERAL SCORING GUIDELINES

- 3 = *Highly Proficient:*** rich, sophisticated, exemplary in all aspects of quality (including both mechanics of writing and clarity/insightfulness of thinking), thoroughly accurate and developed, exceeds expectations for a Candidate at this stage of development, integrates thorough understanding of relevant professional literature/research.
- 2 = *Proficient:*** well developed, good quality (may include very few errors in mechanics, and shows clarity of thinking), fully meets expectations for a Candidate at this stage of development, shows understanding of relevant professional literature/research. **This is the TARGET score.**
- 1 = *Not Proficient:*** superficially developed, minimally acceptable quality (Written work/plans may include a few errors in mechanics and inconsistent clarity in thinking), lags behind expectations for most Candidates at this stage of development. May show beginning/weak understanding of the relevant professional literature/research.

Lesson Plan Rubric

Section 1: Classroom Context			
Criteria	Not Proficient 1	Proficient 2	Highly Proficient 3
<p>The Candidate identifies individual and group prerequisites in order to design instruction to meet learners’ needs in the cognitive, linguistic, social, emotional, and physical areas of development.</p> <p><i>InTASC 1</i> <i>VDOE 1</i> <i>CAEP 1.1</i> CAEP CCT: Diversity</p>	<p>○ The evidence indicates that the Candidate demonstrated a partial understanding of learners’ developmental levels, planning instruction that aligned to the developmental levels of some (but not all) of the learners.</p>	<p>○ The evidence indicates that the Candidate demonstrated an accurate understanding of learners’ developmental levels by planning varied instruction appropriate to support learning goals, actively engaging learners in learning that aligned with overall subsets of learner’s developmental levels.</p>	<p>○ The evidence indicates that the Candidate demonstrated an accurate understanding of learners’ developmental levels and was able to plan and articulate specific, varied strategies for engaging learners in the learning and providing varied options for learners to demonstrate mastery aligned to the developmental learning level of each learner and groups of learners in the classroom.</p>
Section 2: Planning for Instruction			
Criteria	Not Proficient 1	Proficient 2	Highly Proficient 3

<p>The Candidate identifies performance-based objectives and/or appropriate curriculum goals/outcomes that are relevant to learners.</p> <p><i>InTASC 7 VDOE 2 CAEP 1.1 CAEP 1.2 CAEP CCT: Diversity</i></p>	<p>○ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with standards and/or use of prior knowledge.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives that used appropriate scaffolds and differentiation that address learner needs to build on prior knowledge.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with multiple standards, including College- and Career-Ready Skills, clearly connects to the range of previous and future learning.</p>
<p>The Candidate identifies national/state/local standards that align with objectives, are appropriate for curriculum goals, and are relevant to learners.</p> <p><i>InTASC 7 VDOE 2 CAEP 1.1 CAEP 1.2 CAEP CCT: Diversity</i></p>	<p>○ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with national/state/local standards that are aligned with appropriate for curriculum goals.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives closely aligned with national/state/local standards address learner needs, build on prior knowledge and used instructional strategies, including College- and Career-Ready Skills, and connects to future learning.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with multiple standards, including College- and Career-Ready Skills, clearly connects to the range of future learning.</p>
<p>The Candidate creates learning experiences that make content accessible and meaningful for learners to ensure content mastery.</p> <p><i>InTASC 4 VDOE 1 CAEP 1.1 CAEP 1.3</i></p>	<p>○ The evidence indicates that the Candidate demonstrated knowledge of the content using explanations that were not always accurate and clear.</p>	<p>○ The evidence indicates that the Candidate displayed knowledge of the important content in the discipline by using content-related strategies that clearly identify how concepts related to one another, using developmentally</p>	<p>○ The evidence indicates that the Candidate displayed extensive knowledge of the important concepts in the discipline by using multiple representations, multiple formats, and appropriate content-related strategies and developmentally appropriate terminology/language,</p>

		appropriate terminology/ language to build an understanding of content for all learners.	including varied levels of questioning, a wide variety of opportunities to build a higher-level of understanding of content for all learners.
Criteria	Not Proficient 1	Proficient 2	Highly Proficient 3
<p>The Candidate organizes and creates face-to-face and/or virtual environments that support individual and collaborative learning.</p> <p><i>InTASC 3 VDOE 5 CAEP 1.1 CAEP 1.4 CAEP 1.5 CAEP CCT: Technology</i></p>	<p>○ The evidence indicates that the Candidate transitions inefficiently between learning activities with some loss of instructional time, monitoring and responding to learner behavior (both positive and negative) in a way that is inconsistent, inappropriate and/or ineffective for meeting classroom and individual learner needs, including in virtual environments.</p>	<p>○ The evidence indicates that the Candidate transitions efficiently and smoothly between learning activities with minimal loss of instructional time, using varied learning situations that includes monitoring and responding to learner behavior (both positive and negative) in a way that is consistent, appropriate and effective for meeting classroom and individual learner needs; including in virtual environments.</p>	<p>○ The evidence indicates that the Candidate demonstrates respect for and interest in individual learner’s experiences, thoughts and opinions and uses transitions that are seamless, effectively maximizing instructional time, and combining independent, collaborative, and the individual needs of all learners, including in virtual environments.</p>
<p>The Candidate uses appropriate technology to engage learners and to assess and address learner needs.</p> <p><i>InTASC 6 VDOE 4 CAEP 1.1 CAEP 1.5 CAEP CCT: Technology CAEP CCT: Diversity</i></p>	<p>○ The evidence indicates that the Candidate is inconsistent, inappropriate and/or ineffective in using appropriate technologies for meeting classroom and individual learner needs.</p>	<p>○ The evidence indicates that the Candidate uses appropriate technology in a way that is consistent, appropriate and effective for meeting classroom and individual learner needs.</p>	<p>○ The evidence indicates that the Candidate uses appropriate technology effectively, maximizing instructional time, and combining independent, collaborative, and the individual needs of all learners.</p>
<p>The Candidate facilitates learners’ use of appropriate tools and resources to maximize content learning in varied contexts.</p> <p><i>InTASC 5 VDOE 2</i></p>	<p>○ The evidence indicates that the Candidate implemented teacher-directed lessons with limited use of tools appropriate for the content being learned.</p>	<p>○ The evidence indicates that the Candidate used a variety of appropriate tools to explore content that includes learner-led learning activities including cross-curricular learning</p>	<p>○ The evidence indicates that the Candidate used collaborative problem solving as a way to explore content with the majority of instruction being learner-led learning activities including real-world and cross-curricular learning opportunities,</p>

<p><i>CAEP 1.1</i> <i>CAEP 1.4</i> <i>CAEP 1.5</i> <i>CAEP CCT:</i> Technology</p>		<p>opportunities, with clear connections between content and other disciplines.</p>	<p>with clear connections between content and other disciplines that encouraged independent, creative and critical thinking.</p>
<p>Criteria</p>	<p>Not Proficient 1</p>	<p>Proficient 2</p>	<p>Highly Proficient 3</p>
<p>The Candidate plans how to achieve learning goals, choosing accommodations to differentiate instruction for individuals and groups of learners.</p> <p><i>InTASC 2</i> <i>VDOE 2</i> <i>CAEP 1.1</i> CAEP CCT: Diversity</p>	<p>○ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable goals aligned to the developmental levels of some (but not all) of the learners; instruction was inappropriate and/or inaccessible for groups of learners.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable goals that used appropriate scaffolds and differentiation that aligned with overall subsets of learner’s developmental levels making learning accessible and challenging for the classroom.</p>	<p>○ The evidence indicates that the Candidate demonstrated an accurate understanding of learners’ developmental levels and was able to plan and articulate specific, varied strategies for engaging learners in the learning and providing varied options for learners to demonstrate mastery aligned to the developmental learning level of each learner and groups of learners in the classroom.</p>
<p>The Candidate plans instruction based on pre-assessment data, prior knowledge, and skills.</p> <p><i>InTASC 7</i> <i>VDOE 2</i> <i>CAEP 1.1</i></p>	<p>○ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with pre-assessment data and/or use of prior knowledge.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives that address learner needs to build on prior knowledge aligned with pre-assessment data and/or use of prior knowledge.</p>	<p>○ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with pre-assessment data and/or use of prior knowledge.</p>

Section 3: Instruction and Assessment			
Criteria	Not Proficient 1	Proficient 2	Highly Proficient 3
<p>The Candidate develops appropriate sequencing and pacing of learning experiences and provides multiple ways to demonstrate knowledge and skill.</p> <p><i>InTASC 8 VDOE 2 CAEP 1.1</i></p>	<p>○ The evidence indicates that the Candidate used limited instructional strategies that did not allow for differentiated learning experiences and/or did not provide multiple ways to demonstrate learning.</p>	<p>○ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiated learning situations.</p>	<p>○ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiated learning situations allowing all learners to take ownership of their learning.</p>
<p>The Candidate uses a variety of instructional strategies to encourage learners to develop an understanding of the content and to apply knowledge in meaningful ways.</p> <p><i>InTASC 8 VDOE 3 CAEP 1.1</i></p>	<p>○ The evidence indicates that the Candidate used limited instructional strategies that did not allow for differentiated learning situations and/or did not engage and challenge learners.</p>	<p>○ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiated learning situations allowing learners to have ownership of their learning.</p>	<p>○ The evidence indicates that the Candidate used a variety of instructional strategies, including appropriate, available technologies, to engage and challenge learners in differentiated learning situations allowing all learners to have ownership of their learning.</p>
<p>The Candidate engages learners in multiple ways of demonstrating knowledge and skill as part of the assessment process.</p> <p><i>InTASC 6 VDOE 4 CAEP 1.1</i></p>	<p>○ The evidence indicates that the Candidate provided limited opportunities for learners to demonstrate learning and did not have opportunities of feedback or analysis of learner data to inform future instruction.</p>	<p>○ The evidence indicates that the Candidate provided effective feedback to learners on multiple instances of formative, summative, informal, and/or formal assessments and analyzed data to inform instruction.</p>	<p>○ The evidence indicates that the Candidate provided multiple opportunities for learners to demonstrate learning by using formative, summative, informal, and/or formal assessments. Assessments were differentiated to match a full rating of learner needs and abilities.</p>

Section 4: Reflection: Impact on Learning			
Criteria	Not Proficient 1	Proficient 2	Highly Proficient 3
<p>The Candidate uses a variety of self-assessment and reflection strategies to analyze and reflect on his/her impact on student learning and to plan for future instruction/ adaptations.</p> <p><i>InTASC 9</i> <i>VDOE 7</i> <i>CAEP 1.1</i></p>	<p>○ The evidence indicates that the Candidate did not participate in professional development; participated in professional development not relevant to personal needs identified through ethical and responsible self-reflection to plan for future instruction/ adaptations, and personal learning goals.</p>	<p>○ The evidence indicates that the Candidate used self-reflection to identify professional development opportunities relevant to learning needs and applied activities in their teaching in an ethical and responsible manner to plan for future instruction/ adaptations, and personal learning goals.</p>	<p>○ The evidence indicates that the Candidate consistently used self-reflection to identify professional development opportunities relevant to improving teaching and learning for specific groups of learners and successfully made systematic application of activities in their teaching in an ethical and responsible manner to plan for future instruction/ adaptations, and personal learning goals.</p>

FACULTY USE ONLY	
	Candidate was not evaluated due to extenuating circumstances that impeded the completion of this assessment.

Some content adapted from the STAR Evaluation developed by Emporia State.