NEW JERSEY CENTER
FOR TEACHING & LEARNING

Progressive Science Initiative® (PSI®)
CSCI6363: Computer Science Capstone & Praxis Preparation

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Course Credit: 2.0 NJCTL credits

Dates & Times:
This is a 2-credit, self-paced course, covering 6 modules of content. The exact number of hours that you can expect to spend on each module will vary based upon the module coursework, as well as your study style and preferences. You should plan to spend approximately 15 hours per credit working online, and up to 30 hours per credit working offline.

Graduate Student Handbook: www.njctl.org/graduate-handbook/

COURSE DESCRIPTION:
This course prepares teachers for the Computer Science Praxis Exam (5652). Topics include Impacts of Computing, Algorithms & Computational Thinking, Programming, Data, and Computing Systems & Networks. It includes 5 modules including instructional/review presentations with embedded formative assessment; mastery questions with solutions; a discussion board, where questions are addressed by certified instructors; and a unit test. The 6th module includes a full-length Praxis-style test.

STUDENT LEARNING OUTCOMES:
Upon completion of the course, the student will be able to:
1. Understand the impacts of computing on everyday life.
2. Make connections between programming languages they know, and how those languages are represented in pseudocode.
3. Create and use data, including libraries and APIs, to create programs.
4. Understand how data is stored and shared in computers.
5. Explain basic computer networking.

TEXTS, READINGS, INSTRUCTIONAL RESOURCES:
Required Texts:

•Participants will download SMART Notebook presentations, homework files, labs, and teacher resources from the online course

COURSE REQUIREMENTS:

In order to receive a Passing grade, the participant must complete the following course requirements:
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Activities: A number of different learning activities will ensure participant engagement and learning in the course. These include:

- Engage in video module lessons which demonstrate minimized direct instruction followed by frequent formative assessment
- Completion of formative assessments aligned to learning objectives which include detailed analysis when answered incorrectly.
- Interaction with module discussion boards that allow conversation with peers and course instructors about the module's content, delivering that content to students. Discussion boards also serve as a place to ask and answer questions related to the module's content.
- Short Answer Assignment: Each module requires one (1) original response to a given prompt. These prompts are typically based upon course lessons and require teachers to analyze, reflect, and make connections between the module's content and their own classroom practice.
- Mastery Exercises: For each module, these multiple-choice question quizzes assess the content knowledge gained in a module. Participants have the opportunity to retake; random questions are pulled from a larger question bank on each attempt ensuring varied questions.
- Module Exam: One is completed at the end of each module. It is a culminating exam consisting of praxis-like multiple-choice questions aligned to the exam objectives.
- Reflection Paper: At the end of the course, participants are required to reflect on the knowledge taught in the course, make connections, and compare/contrast their current pedagogy with new strategies gained in this assignment.
- Final Exam: At the end of the course, a comprehensive exam consisting of Multiple-Choice questions assesses the content knowledge learned throughout the course in preparation for the praxis exam.

GRADE DISTRIBUTION AND SCALE:

Grade Distribution:

Short Answer Assignments – 8%
Mastery Exercises – 8%
Reflection Paper – 4%
Module Exams – 70%
Final Exam – 10 %

Grade Scale:

A	93 – 100
A-	90 – 92
B+	86 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79
C	73 – 76
C-	70 – 72

D	60.0 – 69.9
F	59.9 or below

GRADING RUBRIC:
The following rubric is used to score:
· Short Answer Assignment – 8% of grade
· Reflection Paper – 4% of grade

The minimum possible score for this rubric is 4 points, and the score will be converted to the minimum grade available in this module (which is zero unless the scale is used). The maximum score 25 points will be converted to the maximum grade.

Intermediate scores will be converted respectively and rounded to the nearest available grade. If a scale is used instead of a grade, the score will be converted to the scale elements as if they were consecutive integers.

	Meets Expectation	**Approaches Expectation**	**Below Expectation**	**Limited Evidence**
	7 points	***5 points***	***3 points***	***1 point***
Content	·Demonstrates excellent knowledge of concepts, skills, and theories relevant to topic.	·Demonstrates fair knowledge of concepts, skills, and theories.	·Demonstrates incomplete or insubstantial knowledge of concepts, skills, and theories.	·Demonstrates little or no knowledge of concepts, skills, and theories.
Depth of Reflection	·Content is well supported and addresses all required components of the assignment.	·Content is partially supported; addresses most of the required components of the assignment.	·Content contains major deficiencies; addresses some of the required components of the assignment.	·Content is not supported and/or includes few of the required components of the assignment.

Evidence and Practice	·Response shows strong evidence of synthesis of ideas presented and insights gained throughout the entire course. The implications of these insights for the respondent's overall teaching practice are thoroughly detailed, as applicable.	·Writing is mostly clear, concise, and well organized with good sentence/paragraph construction. Thoughts are expressed in a coherent and logical manner. There are no more than five spelling, grammar, or syntax errors per page of writing.	·Response is missing some components and/or does not fully meet the requirements indicated in the instructions. Some questions or parts of the assignment are not addressed. Some attachments and additional documents, if required, are missing or unsuitable for the purpose of the assignment.	·Response excludes essential components and/or does not address the requirements indicated in the instructions. Many parts of the assignment are addressed minimally, inadequately, and/or not at all.
	4 points	***3 points***	***2 points***	***1 point***
Writing Quality	·Writing is well-organized, clear, concise, and focused; no errors.	·Some minor errors or omissions in writing organization, focus, and clarity.	·Some significant errors or omissions in writing organization, focus, and clarity.	·Numerous errors in writing organization, focus, and/or clarity.

ACADEMIC STANDING:
NJCTL has established standards for academic good standing within a student's academic program. Students enrolled in any NJCTL online course must receive an 80 or higher to successfully complete a course and receive credit for that course. An 80 is equivalent to a GPA of 2.7 or B-. Additionally, students in an endorsement program must receive a cumulative GPA of 3.0 for all courses combined in order to successfully complete the program.

ACADEMIC INTEGRITY:
Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /repurposing your own work, unauthorized possession of academic materials, and unauthorized collaboration.

CITING SOURCES WITH APA STYLE:
All students are expected to follow proper writing and APA requirements when citing in APA (based on the APA Style Manual, 6th edition) for all assignments.

DISABILITY SERVICES STATEMENT:
We are committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Dean of Students, Melissa Axelsson, for additional information to coordinate reasonable accommodations for students with documented disabilities (melissa@njctl.org).

NETIQUETTE:
Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.

CLASS SCHEDULE:

Module	Required Readings	Assignments
1 – Impacts of Computing	• Understand computing as a way of expressing creativity, solving problems, enabling communication, and fostering innovation in a variety of fields and careers. • Know the obstacles to equal access to computing among different groups and the impact of those obstacles. • Understand beneficial and harmful effects of computing innovations and the trade-offs between them. • Know different methods of protecting intellectual property rights and the trade-offs between them in a variety of contexts (ie. Creative Commons, open source, copyright). • Understand ethical and unethical computing practices and their social, economic, and cultural implications. • Know privacy and security issues regarding the acquisition, use, and disclosure of information in a digital world.	• Mastery Exercise • Module Exam
2 – Programming	• Understand and apply knowledge of programming control structures, standard operators, variables, correctness, extensibility, modifiability, and reusability. • Understand and apply knowledge of procedures, event-driven programs, usability, data structures, debugging, documenting and reviewing code, libraries and APIs, IDEs, and programming language paradigms, including object-oriented concepts.	• Mastery Exercise • Module Exam
3 – Data	• Understand bits as the universal medium for expressing digital information. • Be familiar with concepts of data encryption and decryption. • Know how to use computational tools, including spreadsheets, to analyze data in order to discover, explain, and visualize patterns, connections, and trends. • Be familiar with the use of computing in simulation and modeling. • Be familiar with methods to store, manage, and manipulate data. • Be familiar with a variety of computational methods for data collection, aggregation, and generation.	• Mastery Exercise • Module Exam

4 – Computer Systems & Networking	● Know that operating systems are programs that control and coordinate interactions between hardware and software components. ● Be familiar with computing systems embedded in everyday objects (e.g. Internet of Things, ATMs, medical devices). ● Know the capabilities, features, and uses of different types of computing systems (e.g. desktop, mobile, cluster). ● Be familiar with computers as layers of abstraction from hardware (e.g. logic gates, chips) to software (e.g. system software, applications). ● Be familiar with the steps required to execute a computer program (fetch-decode-execute cycles). ● Be familiar with trade-offs between local, network, and cloud computing and storage. ● Be familiar with communication between devices.	● Mastery Exercise ● Module Exam
5 – Algorithms & Computational Thinking	● Understand abstraction as a foundation of computer science. ● Know how to use pattern recognition, problem decomposition, and abstraction to develop an algorithm. ● Understand number base conversion and binary, decimal, and hexadecimal number systems. ● Understand how to develop and analyze algorithms expressed in multiple formats (e.g. natural language, flowcharts, pseudocode). ● Be familiar with the limitations of computing in terms of time, space, and solvability as well as with the use of heuristic solutions that can address these limitations. ● Understand searching and sorting algorithms; can analyze sorting algorithms for correctness and can analyze searching algorithms for correctness and efficiency. ● Understand simple recursive algorithms (e.g. n factorial, sum of first n integers). ● Be familiar with the use of randomization in computing.	● Mastery Exercise ● Module Exam
6 – Reflection & Final Exam	● Final Exam Review ● Zoom call with professor to prepare for final exam, if needed	● Reflection Paper ● Final Exam