SJSU SAN JOSÉ STATE UNIVERSITY

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Credential Services

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Computer Science Authorization

www.sjsu.edu/education/community/stem-institute

To add the Computer Science Authorization, you are required to file your application directly with the Commission on Teacher Credentialing (CTC). Note that paper applications may take 4 weeks or longer to process.

CTC is the final granting authority for added authorizations.

Follow the instructions below for submitting your paper application to CTC.

1. **Complete the CTC [Credential Application Web Form](#) application.**
    a. Section 2, select "Add Subject/Authorization to Existing Document"
    b. Section 3. select "Teaching Credential" and "Other", Enter Supplementary Authorization: Computer Science
    c. Sections 6-7, complete and answer all questions.
    d. Section 9, complete all sections.
    e. Print a copy.
    f. Sign and date with wet signature.
2. **$100 Application Fee payable to CTC** - Check or Money Order only. Check the [link](#) to make sure the fee amount has not changed.
3. **Include the following supporting documentation with your application:**
    a. Supplementary Authorization Worksheet. Enter your name and SSN.
        i. Introductory Authorization – 10 units (attached, page 2)
        ii. Specific Authorization – 13 units (attached, page 3)
    b. Official SJSU transcripts reflecting completion of CS Authorization courses. You may request for SJSU transcripts [here](#).
    c. CS Authorization Course Descriptions and Program Plan (attached, page 4-6)
    d. Copy of your Multiple or Single Subject Credential. You may look up a copy on the [CTC website](#).
4. **Mail your complete application to:**

    Commission on Teacher Credentialing (CTC)
    651 Bannon Street, Suite 600 A
    Sacramento, CA 95811
    Attn: Certification Division

If you have any questions about the application once it has been mailed to CTC, you may contact them directly at [credentials@ctc.ca.gov](#).

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Rev. 8.2024

SUPP AUTH WORKSHEET FOR : _____ SS# _____

TYPE		SUBJECT	COURSES--GRADE OF "C" OR BETTER						TOTAL
MS	SS	**Agriculture**	animal science	plant science	agricultural mech.				
MS	SS	**Art**	drawing & painting	art history or apprec	crafts				
MS	SS	**Business**	Business Management	Business Marketing /Intro. Business	Computer Concepts	Economics	Bus Comm	Accounting	
MS	SS	**Computer Science**	computational thinking EDTE 195 (3 units)	computing practice and programming EDTE 197 (3 units)	computers and communication devices EDTE 194 (3 units)	impacts of computing (e.g., social, ethical, legal) EDTE 193 (1 unit)			**10**
MS	SS	**English**	grammar or lang struct	composition	literature				
MS	SS	**Health Science**	substance abuse	nutrition	school health programs	Family Life Education		Health Ed Theory	
MS	SS	**Home Economics**	food and nutrition	clothing	child development	family life and parenting		Lab comp	
MS	SS	**Industrial Arts**	drafting or graphic arts	woods or metals	electricity or electronics				
MS	SS	**A Language Other Than English**	grammar	composition	conversation	literature		oral lang prof.	
MS	SS	**Mathematics**	algebra	geometry	real numbers/intro math	OR	3 courses in higher math		
MS	SS	**Music**	vocal music	instrumental music	music hist or apprec	music theory			
MS	SS	**Physical Education**	team sports and games	mvmnt skills	human mvmt, motor dev.	global sports and games			
MS	SS	**Science**	biological sciences	chemistry	physics	geosciences		*lab comp?*	*1 yr seq in two areas?*
MS	SS	**Social Science**	United States history	California history	world history	geography		U. S. govt	

SPECIFIC SUBJECTS

Accounting Including Finance*	Consumer education (Home Economics)	Geography	Ornamental horticulture
Agricultural mechanics	Crafts, including jewelry and ceramics (Art)	Geosciences	Painting and drawing
Animal science	Dance	Graphic Arts	Photography
Anthropology	Drafting	Industrial crafts and plastics	Physics
Auto mechanics	Drama	Instrumental music	Plant science
Biological Sciences✓	Economics	Interior Design (Home	Plastics (Industrial Arts)
Chemistry✓	Economic and consumer education	Economics)✓	Psychology
Child Development (Home Economics) ✓	Electronics	Journalism	Sociology
Clothing and textiles (Home Economics) ✓	English Composition	Literature	Speech
Community and family health, including drug use and abuse	Family Life and Parenting (Home Economics)	Marketing/Entrepreneurship	US Government and US Civics
Comparative political systems and international relations	Family Life Ed including Drug, Alcohol and Tobacco Abuse Prevention (Health Science)**	Metals (Industrial Arts) Office Technologies including Word Processing and Business	US History and California History Vocal Music
Computer Science	Foods and nutrition (Home Economics) ✓ Forestry and horticulture	Communications	Woods (Industrial Arts) World History

* **Must included one course in accounting and one course in finance**
** **Must include the following components: S.T.D.'s; human development and sexuality; parent education; violence prevention; drug prevention**
✓ **Must include laboratory component**

SPECIFIC SUBJECTS IN SCIENCE

To obtain a specific subject in science, the teacher's course of study must include each of the components for that area as shown below.

TOTAL

Biological Sciences	molecular and cellular biology, biology of organisms, and evolution	*lab component?*	
Chemistry	structure and stability, and chemical reactions	*lab component?*	
Geosciences	astronomy, geology, meteorology, and oceanography	*lab component?*	
Physics	energy-mechanics, energy-heat, energy-electricity and magnetism, wave motion, and atomic and nuclear physics	*lab component?*	

SPECIFIC SUBJECT IN COMPUTER SCIENCE

To obtain a specific subject in computer science, the teacher's course of study must include each of the components for that area as shown below.

TOTAL

Computer Science COURSES--GRADE OF "C" OR BETTER	computer programming; data structures and algorithms; digital devices, systems and networks; software design; impacts of computing (e.g., social, ethical, legal) EDTE 193, EDTE 194, EDTE 195, EDTE 197, CS 185C	13

SPECIFIC SUBJECTS	TOTAL		SPECIFIC SUBJECTS	TOTAL

CL-696b 06/2016

San José State University
Introductory Supplementary Authorization in Computer Science
Program Plan

CTC Requirement/Content	SJSU Courses
Impacts of computing: includes ● the social, ethical, and legal issues and impacts of computing, ● the contributions of computer science to current and future innovations in the arts, business, humanities, medicine, and science. ● These topics may be included within courses that cover any of the other content areas.	**EDTE 193 Introduction to Emancipatory Approaches to Computing** This course centers equity and justice in computer science education. In this course, teachers will explore the social, cultural, ethical and legal impacts of computing from the perspectives of individuals, schools, teachers, students, and the global community. Teachers will gain an understanding of the landscape of equity and justice issues related to Computer Science (CS) Education, develop critical thinking skills about computing and related technologies, begin to reimagine computer science education and the design of curricular resources, and learn to design computer programs as a CS learner. Teachers will leave the course imagining and setting goals for what they want their students to know, learn, and be able to do to create a more just future. **Course Learning Outcomes (CLO)** Through course readings, discussions, and activities students will be able to: 1. Identify areas and gain understanding of big issues of equity and justice in CS Education at the individual, school/student, community, and global levels. 2. Analyze impacts of algorithmic bias in programming on individuals, students, schools, communities, and society. 3. Explore issues of ethics and privacy through an examination of the information collected, and how user data is sold/monetized on different online platforms, [Facebook, Google, Online Shopping Sites, etc.] 4. Identify the ways that student data specifically is collected and used. 5. Explore place-based, youth-centered approaches to CS and CS Education and identify topics that are relevant to everyday life to empower K-12 students as users and creators of technology. 6. Reimagine the design of CS Education curricular resources and your goals as a CS educator.
Computing practice and programming: includes - expertise in at least one block--- based, visual (drag-and-drop) programming language (e.g., Alice, Blockly,	**EDTE 194 Computing Practice and Programming Toolkit for Problem-Solving** This course provides an in-depth introduction to programming through a survey of three programming languages: Scratch, MakeCode, and Python. Exploring all three languages

CTC Requirement/Content	SJSU Courses
Kodu, Logo, Scratch, Snap!) or a modern, high-level programming language. ***Computer and communications devices:*** **-** covers the major components and functions of digital devices and the computing systems they compose.	supports teachers to develop a broad range of expertise and see how block and text-based languages work together. Teachers will complete programming activities in all three languages building on Scratch skills developed in EDTE 193 as well as a final project that addresses how to use computer science concepts to address problems that are relevant to their school and community. Teachers learn how computer science can be used as a tool to deepen engagement with classroom content. This course builds on the introductory course by delving deeper into the questions proposed at the conclusion of EDTE 193. Specifically, the course will investigate the following guiding question: How can adding computing skills and practices to my problem-solving toolkit help me answer questions I care about in new ways?How can adding computing skills and practices to my problem-solving toolkit help me answer questions I care about in new ways? **Course Learning Outcomes (CLO)** Upon successful completion of this course, students will be able to: 1. Develop expertise in Scratch, MakeCode, and Python through programming activities. 2. Utilize core CS concepts including data types, variables, conditionals, sequencing, events, loops, and functions through in class programming activities, programming assignments, and projects. 3. Articulate what a computer program does and how it does it. 4. Build a network of devices using physical computing equipment (e.g., the micro:bit). 5. Describe how digital devices communicate, process, and share information going through a cycle of input, process, and output.
Computational thinking: involves - solving problems and designing systems, - using fundamental computing concepts such as decomposition, data representation, generalization/abstraction, and algorithms.	**EDTE 195 Connecting Communities through Computational Thinking and Computing Systems** This course builds on introductory programming knowledge to solve problems and design systems. Students will learn computational thinking strategies using fundamental computing concepts such as decomposition, data representation, generalization, abstraction, and algorithms. Students will understand the role of computer and communication devices in designing and creating innovative solutions. Students will complete activities that investigate computing systems, networks, and the internet. Scratch, MakeCode, and Python will be used to deepen students' instructional and pedagogical practices critical to delivering coherent, relevant computing content in these areas. This course serves as a springboard into the final course in the sequence (EDTE 197) that focuses on curriculum design and modifying materials for use in specific classroom contexts. **Course Learning Outcomes (CLO)**

CTC Requirement/Content	SJSU Courses
	Upon successful completion of this course, students will be able to: 1. Design and implement algorithms in Scratch, MakeCode, and Python. 2. Discuss the tradeoffs of different implementations of a program. 3. Refine existing programs based on knowledge acquired in the course. 4. Read and analyze large data sets in Python using lists and dictionaries. 5. Describe how the internet works and how data is shared among devices. 6. Explore best classroom practices for facilitating students learning computer science 7. Develop the skills to create classroom activities aligned with both CS content standards and best classroom practices.
Computing practice and programming *Computational thinking* *Computer and communications devices*	**EDTE 197 Computer Science Education: Pedagogical Practices for Community Impact** This course focuses on instructional design and professional growth and identity as students prepare to begin their journeys as computer science educators. Students will become familiar with existing curricular materials and learn how to modify and create their own instructional materials to support the integration of computer science content into their home subject and to engage students in computer science content as an independent subject. Topics such as culturally responsive teaching and universal design will be highlighted. Students will design and implement a half day long set of activities to other members of the community (their classmates, undergraduate students, or K-12 students) and then reflect on the process. By the end of the course, students will be confident in creating their own computer science curriculum based on both existing materials and their own students' interests. **Course Learning Outcomes (CLO)** Upon successful completion of this course, students will be able to: 1. Modify existing curricula to meet the needs of your students. 2. Mix and match different pieces of computer science curricula to make a coherent sequence of lessons that are relevant to your students' lived experience. 3. Integrate computer science topics into different disciplines. 4. Design activities, lessons, assessments, and projects that use computer science concepts and tools. 5. Incorporate computer science education standards and frameworks into lesson design. 6. Evaluate different pedagogical approaches in order to more deeply engage students with computer science content. 7. Create a plan to continue professional growth related to computer science.