UNIVERSITY of SOUTH FLORIDA

EDG - 4435 - Programming in Scratch for Teachers.

3 Credits

COURSE SYLLABUS

Semester: Fall 2026
Course Type: 100% Full Distance Learning
Instructor: Dr. Zafer Unal
Office Hours: Online with Appointment
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I. Welcome!

This course introduces you to the Scratch™ programming environment from MIT Media Lab, a powerful block-based programming language specifically designed for education. Through hands-on project development, you will learn to create interactive animations, games, stories, and simulations that can transform your K-12 classroom. We will explore Scratch's visual programming blocks—from motion and looks to advanced features like cloning, custom blocks, and message broadcasting. You will also discover research-based pedagogical strategies for teaching computer science in equitable and engaging ways. By the end of this course, you will have developed a comprehensive portfolio of Scratch projects and lesson plans, ready to inspire computational thinking and creativity in your students across any subject area.

II. University Course Description

This course provides a comprehensive introduction to the Scratch™ programming language and learning environment from the MIT Media Lab for K-12 educators. It covers core topics such as the Scratch interface and coordinate system, motion and animation, control structures (loops, conditionals), user interaction and sensing, variables and data storage, message broadcasting, lists, custom blocks (functions), cloning, and advanced visual and sound effects. The course integrates pedagogical strategies for equitable computer science education and cross-curricular integration, equipping teachers to design and implement engaging Scratch-based learning experiences.

III. Course Prerequisites

None

IV. Course Purpose

This course serves as a practical introduction to block-based programming using Scratch, specifically designed for educators. As visual programming environments become increasingly important for introducing computational thinking in K-12 settings, this course equips teachers with the hands-on skills and pedagogical knowledge needed to create engaging, interactive learning experiences. The course focuses on building from simple sequential animations to

complex, multi-level interactive projects, making it essential for educators seeking to implement creative computing across their curricula and foster computational thinking in all students.

V. Course Format

This fully online course is structured through weekly modules that combine asynchronous recorded lectures with hands-on technical demonstrations and projects. Students engage through discussion boards for peer interaction and complete practical assignments applying AI tools to educational scenarios. The course offers flexibility through asynchronous learning while maintaining support through individual consultation sessions with the instructor as needed.

VI. Student Learning Outcomes

Upon completion of this course, students will be able to:

- Identify the key characteristics, interface components, and educational affordances of the Scratch™ programming environment from MIT Media Lab.
- Apply fundamental Scratch programming concepts including sprites, stage, coordinate systems, sequencing, and basic blocks (motion, looks, sound).
- Implement control structures including loops (repeat, forever) and conditional statements (if-then, if-else) to create interactive programs.
- Design interactive projects using sensing blocks, user input (keyboard and mouse), and event-driven programming.
- Apply data storage and manipulation techniques using variables, lists, and message broadcasting for coordinating sprite actions.
- Create modular, efficient programs using custom blocks (functions) and cloning techniques.
- Integrate pedagogical best practices for equitable computer science education and cross-curricular Scratch implementation in K-12 classrooms.

VII. Course Objectives

Students will:

- Navigate the Scratch programming environment proficiently, demonstrating understanding of sprites, stage, coordinate system, and block categories.
- Create sequential animations and interactive digital presentations using motion, looks, and sound blocks.
- Design interactive games and activities that utilize loops, conditionals, sensing, and user input for engaging student experiences.
- Implement data storage and communication systems using variables, lists, and message broadcasting in multi-level projects.
- Develop complex programs using advanced techniques including custom blocks for modularity and cloning for dynamic object creation.
- Design and document a comprehensive lesson plan that integrates a Scratch project aligned with specific K-12 learning objectives in their subject area.
- Apply research-based pedagogical strategies for teaching computer science, including the "Use-Modify-Create" framework and equitable classroom practices.

VIII. Required Texts and/or Readings and Course Materials

- There are no required text in this course. All of the course materials (videos, readings etc. will be available on the course website with free access. A computer with internet access and capable of running AI applications is required for this course.

IX. Supplementary (Optional) Texts and Materials

NA

X. How to Succeed in this Course

To succeed in this course, students should establish strong study habits from the beginning. This includes completing all weekly readings prior to attempting practical exercises and actively engaging with technical demonstrations. Time management is crucial - start assignments well before deadlines to allow for troubleshooting and maintain detailed documentation of your technical implementation process. Regular engagement with course materials, peers, and AI tools is essential for building practical skills. Finally, always maintain backup copies of all project work to prevent any potential data loss during technical exercises.

XI. Academic Continuity

As this course is already fully online, any disruptions due to emergencies or severe weather will have minimal impact on course delivery. All course materials, including recorded lectures, assignments, and resources, will remain accessible through Canvas. If USF systems are impacted, backup copies of essential materials will be made available through Microsoft Teams. The instructor will communicate any changes or contingency plans through Canvas announcements and email. While most activities are asynchronous, any scheduled synchronous sessions (like individual consultations) will be rescheduled if disrupted, with alternative times communicated through Canvas.

XII. Communication

Primary communication for this course will be through Canvas messaging and announcements. For urgent matters, you may contact your instructor with the email provided on top. Your instructor typically responds to messages within 24 hours during weekdays and 48 hours on weekends. Virtual office hours are available by appointment through Microsoft Teams. Professional communication etiquette is expected in all interactions - please include your name and course number in email subjects.

XIII. Grading Scale

Grading Scale (%)	
90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

XIV. Grade Categories and Weights

The final grade is directly tied to the mastery of each sub-competency. Each assignment will be graded using a specialized rubric designed to assess mastery of its corresponding sub-competency.

Sub-Competency	Assessments	Weight of final Grade
4.1: Identify characteristics and apply concepts of the Scratch™1 programming language learning environment from the MIT Media Library.	**Project 1: Simple Animation** Sequential animation teaching a K-12 concept1	10%
	Project 2: Interactive Quiz/Game User input and conditional logic application	15%
	Project 3: Multi-Level Interactive Story/Game Broadcasting, variables, and scene management	20%
	Advanced Programming Projects Custom blocks, cloning, and advanced effects (Weeks 9-11)	20%
	Final Scratch Project Comprehensive project demonstrating all skills	20%
	Complete Lesson Plan Standards-aligned lesson plan with Scratch integration	10%
Course Participation	Consistent engagement in weekly modules and discussions	5%
TOTAL		100%

XV. Instructor Feedback Policy & Grade Dissemination

Course modules open every Monday at 12:00 AM and close Sunday at 11:59 PM EST. All assignments must be submitted within this one-week window; late submissions are not accepted given the full week provided for completion. Individual feedback and grades will be posted in Canvas by Wednesday 5:00 PM of the following week. Major assignments like projects and the final portfolio may require additional grading time, which will be communicated in advance. All grades and feedback can be accessed through the Canvas gradebook.

XVI. Course Schedule.

Week	Topics & Subitems	Assessment/Assignment
1	**Introduction to Creative Computing and Scratch Environment:** (1) What is Scratch and block-based programming? (2) The Scratch interface: sprites, stage, coordinate system (3) Block categories: Motion, Looks, Sound (4) Sequencing and basic animation	**Hands-on:** Create a simple sequential animation ("Hello World" or "All About Me" project). Explore the Scratch website and its resources. **Assignment:** Create an educator account and complete the official "Getting Started" tutorial.

		Reflection: Write a journal entry on initial impressions and potential cross-curricular uses.
2	**Motion, Looks, and Sound in Detail:** (1) Using X-Y coordinates for positioning (2) Changing costumes and backdrops (3) Adding and manipulating sounds (4) Creating smooth animations	**Hands-on:** Develop an interactive digital postcard or animated "fun fact" presentation about a topic of their choice. **Project 1 Draft:** Begin planning an animation that teaches a simple concept from their K-12 subject area.
3	**Control Structures: Loops:** (1) Repeat and forever loops (2) Introducing efficiency through repetition (3) Using the pen extension (4) Drawing with loops	**Hands-on:** Create a "drawing" project using the pen extension and loops to draw geometric shapes or patterns. **Finalize Project 1:** Submit the simple animation project with documentation.
4	**Sensing and User Input:** (1) Keyboard and mouse input blocks (2) Making projects interactive (3) Collision detection (4) Creating controlled sprites	**Hands-on:** Build a simple maze game where the sprite is controlled by arrow keys and must avoid touching the walls. **Project 2 Draft:** Begin developing an interactive quiz or game using user input (e.g., a "Guess the Number" game).
5	**Conditional Statements:** (1) If-then logic (2) If-else decision-making (3) Comparison operators (4) Boolean logic	**Hands-on:** Refine the maze game to include a win/loss condition and a timer. **Finalize Project 2:** Submit the interactive quiz or game, including a brief explanation of the logic used.
6	**Variables and Data Storage:** (1) Creating and using variables (2) Tracking scores, health, or progress (3) Variable scope (4) Incrementing and decrementing	**Hands-on:** Create a "catch the object" game where points increase/decrease when a catcher touches the correct/incorrect objects. **Reflection:** Write a reflection on debugging strategies encountered so far and effective methods for troubleshooting in the classroom.
7	**Broadcasting Messages:** (1) Event-driven programming (2) Coordinating actions between sprites (3) Managing game states (4) Scene transitions	**Hands-on:** Design a multi-level game (e.g., Pong) where "messages" are sent to change backdrops and manage game states (Start, Play Level 1, Game Over). **Project 3 Draft:** Plan a larger, multi-part interactive story or game that uses broadcasting to manage scene changes.
8	**Lists for Storing Multiple Data:** (1) Creating and populating lists (2) Adding, deleting, and accessing list items (3) Using lists for game content (4) Practical applications	**Hands-on:** Create an interactive vocabulary flashcard generator or a "hangman" style game using lists for words and hints.

		Finalize Project 3: Submit the multi-level game or interactive story.
9	**Custom Blocks (Functions):** (1) Creating custom blocks (2) Parameters and inputs (3) Organizing code for modularity (4) Promoting code reuse and efficiency	**Hands-on:** Rebuild an earlier project using custom blocks to make the code cleaner and more efficient. **Lesson Plan Draft:** Begin drafting a full lesson plan for their own students that integrates a Scratch project aligned with specific learning objectives in their subject area (e.g., history timeline, science simulation, math graphing project).
10	**Cloning for Dynamic Objects:** (1) The clone block (2) Creating many objects dynamically (3) Managing clones (4) Game applications (enemies, projectiles, collectibles)	**Hands-on:** Develop a "shooter" or "whack-a-mole" style game that uses cloning for multiple targets. **Peer Review:** Provide feedback on a colleague's Lesson Plan Draft using the TIPP&SEE learning strategy.
11	**Advanced Aesthetics:** (1) Manipulating sound and music (2) Advanced pen effects (3) Graphic effects (ghost, fisheye, mosaic) (4) Synchronizing visual and audio elements	**Hands-on:** Create a music maker or a "dance party" project that synchronizes movement, sound, and visual effects. **Refine Lesson Plan:** Incorporate feedback received from peer review.
12	**Pedagogy of CS Education:** (1) Equitable CS education strategies (2) Fostering a growth mindset (3) Project-based learning with Scratch (4) The "Use-Modify-Create" framework	**Discussion:** Review research-based pedagogical approaches. Analyze student-made projects from the Scratch website. **Final Project Brainstorming:** Outline the final project they will build using the skills acquired.
13	**Classroom Integration & Troubleshooting:** (1) Managing a Scratch classroom (2) Assessing student projects (3) Cross-curricular integration ideas (4) Troubleshooting common errors	**Workshop:** Troubleshooting common student errors in mock projects. Share ideas for different subject integrations (e.g., using Scratch for a digital map in social studies). **Final Project Development:** Work on building the comprehensive final Scratch project.
14	**Showcase & Reflection:** (1) Presentation of final projects (2) Sharing lesson plans (3) Professional reflection (4) Building a Scratch educator community	**Presentation:** Teachers present their final Scratch projects and associated lesson plans to the class. **Submit Final Deliverables:** Final Project, completed Lesson Plan, and a final reflection on professional development and classroom implementation plans.

* Note: The Schedule is subject to revision

XVII. General Education Statement (undergraduate only – Required if a Gen Ed course)
NA

XVIII. Integration of This Course into Your Academic Experience (Gen Ed courses only)
NA

XIX. Global Citizens Project (only required if a GCP course; must be verbatim)
NA

XX. USF Core Syllabus Policies
USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, pregnancy and related conditions, and sexual harassment that **apply to all courses at USF**. Be sure to review these online: usf.edu/provost/faculty-success/resources-policies-forms/core-syllabus-policy-statements.aspx

XXI. Course Policies: Grades
Late Work Policy: Offer specifics about your policy on late work.
Each module provides a full 7-day window for completion, and no late submissions will be accepted after the weekly deadline. To ensure success in this course, it is strongly recommended to begin each module on Monday rather than waiting until the weekend. Starting early allows time to troubleshoot technical issues, engage meaningfully in discussions, and seek clarification if needed. Students who consistently complete work early in the module week typically perform better and experience less stress than those who leave work until the last minute.

Medical Excuses:
If illness prevents coursework completion, students must immediately notify the instructor and submit medical documentation. While this is an online course with no physical attendance requirements, prompt communication regarding any medical issues impacting your ability to complete coursework is essential for arranging accommodations.

Grades of "Incomplete":
For graduate courses: An Incomplete grade ("I") is exceptional and granted at the instructor's discretion only when students are unable to complete course requirements due to illness or other circumstances beyond their control. The course instructor and student must complete and sign the "I" Grade Contract Form that describes the work to be completed, the date it is due, and the grade the student would earn factoring in a zero for all incomplete assignments. The due date can be negotiated and extended by student/instructor as long as it does not exceed two semesters for undergraduate courses and one semester for graduate courses from the original date grades were due for that course. An "I" grade not cleared within the two semesters for undergraduate courses and one semester for graduate courses (including summer semester) will revert to the grade noted on the contract.

Attendance Policy:

For this online course, regular participation is measured through timely completion of weekly modules and engagement with course materials. Students are expected to log in to the course per week to review content, participate in discussions, and complete assignments.

Campus Free Expression:
It is fundamental to the University of South Florida's mission to support an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles, this course may involve discussion of ideas that you find uncomfortable, disagreeable, or even offensive. In the instructional setting, ideas are intended to be presented in an objective manner and not as an endorsement of what you should personally believe. "Objective" means that the idea(s) presented can be tested by critical peer review and rigorous debate, and that the idea(s) is supported by credible research. In this course you may be asked to engage with complex ideas and to demonstrate an understanding of the ideas. Understanding and engaging with an idea does not require you to believe it or to agree with it.

Final Examinations Policy:
No exam, non-applicable

XXII. Course Policies: Technology and Media (include sections as applicable to your course)

Canvas:
This course is fully delivered through Canvas Learning Management System. Students must log in regularly to access course materials, assignments, and announcements. Weekly modules open Monday 12:00 AM and close Sunday 11:59 PM EST. All course communication, submission of assignments, and grade distribution will be conducted through Canvas. For technical support, contact USF IT at (813) 974-1222 or help@usf.edu.

XXIII. Course Policies: Student Expectations

Health and Wellness: Example statement supporting student health and wellbeing.

Your health is a priority at the University of South Florida. We encourage members of our community to look out for each other and to reach out for help if someone is in need. If you or someone you know is in distress, please make a referral at www.usf.edu/sos so that the Student Outreach & Support can contact and provide helpful resources to the student in distress. A 24-hour licensed mental healthcare professional, offered through the counseling center, is available by phone at 813-974-2831, option 3. Please remember that asking for help is a sign of strength. In case of emergency, please dial 9-1-1.

Title IX Policy: It is recommended you include the paragraph below verbatim.

Title IX provides federal protections for discrimination based on sex, which includes discrimination based on pregnancy, sexual harassment, and interpersonal violence. In an effort to provide support and equal access, **USF has designated all faculty (TA, Adjunct, etc.) as Responsible Employees, who are required to report any disclosures of sexual harassment, sexual violence, relationship violence or stalking.** The Title IX Office makes every effort, when safe to do so, to reach out and provide resources and accommodations, and to discuss possible options for resolution. Anyone wishing to make a Title IX report or seeking accommodations may do so online, in person, via phone, or email to the Title IX Office. For

information about Title IX or for a full list of resources please visit: https://www.usf.edu/title-ix/gethelp/resources.aspx. *If you are unsure what to do, please contact Victim Advocacy – a confidential resource that can review all your options – at 813-974-5756 or va@admin.usf.edu.*

Generative AI: With advancements in AI, tools like GPT-4 can generate human-like text, raising potential issues related to academic integrity and the authenticity of student work. Hence, it's essential to establish clear policies that are communicated to students from the outset of a course. CITL has developed some recommendations that you may consider using in your syllabus here: **CITL Generative AI Syllabus Course Policy Recommendations**

Course Hero / Chegg Policy: Offer specifics about your policy on contract cheating, paper mills, or the use of websites that enable cheating.

Example: The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Professionalism Policy:

All course interactions must maintain professional etiquette. Students will communicate respectfully in discussion boards, emails, and group work. Written communications must be clear, appropriate, and maintain a professional tone. Disruptive behavior in online interactions may affect your final grade. For group activities, timely responses and meaningful contributions are required.

Netiquette Guidelines

Professional communication is essential in our online learning environment. When participating in course activities, maintain the same respect and courtesy as in face-to-face interactions. Consider diverse perspectives and remember that written communication lacks verbal cues. Keep messages clear, focused, and constructive. Always proofread for clarity, avoiding all caps and informal language. Complete thoughts on one topic before introducing new ones. Avoid sarcasm and humor that could be misinterpreted. Following these guidelines in Canvas will create a positive learning environment.

End of Semester Student Evaluations:

All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

XXIV. Learning Support and Campus Offices

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.

SAS website for the Tampa and Sarasota-Manatee campuses.

SAS website for the St. Pete campus.

Academic Support Services
The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the Office of Student Success website.

Canvas Technical Support
Include information where students can find technical support.
Example: If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the "Canvas Help" page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.
IT website for the Tampa campus.
IT website for the St. Pete campus.
IT website for the Sarasota-Manatee campus.

Center for Victim Advocacy
Example: The Center for Victim Advocacy empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.

Counseling Center
Example: The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training that enhances student academic and personal success. Contact information is available online.
Counseling Center website for the Tampa campus.
Counseling Center website for the St. Pete campus.
Counseling Center website for the Sarasota-Manatee campus.

Tutoring
Example: The Tutoring Hub offers free tutoring in several subjects to USF undergraduates. Appointments are recommended, but not required. For more information, email asctampa@usf.edu.
Tutoring website for the Tampa campus.
Tutoring website for the St. Pete campus.
Tutoring website for the Sarasota-Manatee campus.

Writing Studio
Example: The Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, email: writingstudio@usf.edu.
Writing studio website for the Tampa campus.
Writing studio website for the St. Pete campus.
Writing studio website for the Sarasota-Manatee campus.

XXV.Important Dates to Remember

All dates, assignments, and course content are tentative and subject to change at the instructor's discretion. Note: While modules follow a weekly schedule, changes will be announced through Canvas at least one week in advance

For official USF academic deadlines and holidays, refer to the Academic Calendar at http://www.usf.edu/registrar/calendars/