EDCI 5333.060
INNOVATION, SCIENCE, AND TECHNOLOGY APPLICATIONS

{2026 Spring Course Syllabus}

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Instructor Information

Course Description:

This graduate course is designed to introduce students to the essentials of creativity, design and engineering using innovative applications and technologies such as computer coding, modeling, introductory robotics, and 3D printing. Students will be able to write basic computer code, develop simple games, and incorporate robotics into instruction. Furthermore, students will examine how emerging technologies such as 3D modeling and printing can be integrated into the K-12 classroom.

Evaluation and Grading:

- Reading Assignments/Discussions (10-25 Points Each)
- Project-Based Applications (20-50 Points Each)
- Major Projects (100 Points Each): Coding, Robot Builds, 3D Printing

A = 90-100% B = 80-89% C= 70-79%
D= 60-69% F = 59% or below

Required Textbooks:

- *Design Innovative Robots with LEGO SPIKE Prime: Seven creative STEM robotic designs to challenge your mind by Aaron Maurer. ISBN: 1801811571*
- Assigned Readings

Note: The primary etextbook is being provided free of charge by the Muntz Library: https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=6885985

Student Learning Objectives:

The purpose of this course is to help educators expose students to basic computer programming and new technologies in hopes of inspiring students to pursue careers in science, technology, mathematics, and engineering (STEM) fields within a global economy. More specifically and in keeping with U.S. National Education Technology Standards, the National Educational Technology Standards (NETS) recommended by the International Society for Technology in Education (ISTE), and the Next Generation Science Standards (NGSS), by the end of the course you will better be able to:

- Explore basic concepts in computational thinking and problem solving (INTASC Standards: 1, 4, 6, 100)
- Apply basic core computer programming logic and reasoning skills (movement, sensors, program flow) (INTASC Standards: 1, 6, 10)
- Use the basic components of a circuit (power source, wires, input and output) (INTASC Standards: 1, 5, 6)
- Build robots to be controlled autonomously INTASC Standards: 1, 5, 6)
- Understand how everyday science and technologies apply to the real word (INTASC Standards: 1, 6, 9, 10)
- Use innovative technologies to facilitate and inspire student learning and creativity (INTASC Standards: 1, 3, 6, 9, 10)

Required Supplies:

Makey-Makey Kit (http://www.makeymakey.com/)

Lego Spike Prime Robotics Set (this kit may borrowed from the School of Education). Do not purchase this set prior to class instructions.

Technology Access: This is an online course and will require the following reliable technology:

Hardware: Desktop or Laptop computer with Internet access; A camera, microphone, and sound.

Software:

- A current operating system (Microsoft or Apple)
- A web browser (e.g., Chrome, Safari, Firefox, etc.)
- Access to Canvas and email (Patriot Mail)
- Microsoft Office (Available at no charge to students at https://www.uttyler.edu/it/office365/proplus.php
- Adobe Reader or another PDF reader such as Preview on the Mac
- Other software as noted in each module (e.g. Lego, Scratch)

Note: If your Internet connection is down, it is your responsibility to seek access at a venue such as in the UTT computer lab or a public library to complete and submit your work on time. Technology related problems (e.g., email, matters of access etc.) can often be solved by calling the UT Tyler Information Technology Hotline at (903) 565-5555 x2 or by emailing them at itsupport@patriots.uttyler.edu. If you need Canvas support, see https://www.uttyler.edu/canvas/.

Course Policies:

1. Class Participation: This course is designed as an online course and you are required to attend!You will have a weekly reading and assignment (e.g. reflection, discussion) due by Sunday at 11:59 PM. Projects will be due at specified dates/times as noted in the syllabus. The course schedule has been set up so that new assignments will be posted on Mondays. Students should expect to spend a minimum of six hours per module per week.

2. Grading Policy: All assignments are to be submitted on or prior to the due date. Late work is not accepted without prior permission from the instructor. Be aware that technical difficulties or lack of Internet access or access to required technologies and software are not accepted as excuses for late work or incomplete work. Please proofread assignments carefully so no spelling, grammatical, and/or punctuation errors exist. Points for spelling, grammatical, and/or punctuation are included in the grading scheme for each assignment.

Grades of "I" will be given only when there is a compelling reason (e.g., serious illness). If you have a question or need help, please email prior to the due date and allow up to 48 hours for responses.

Descriptions of all projects and assignments will be posted on Canvas. Criteria mentioned in these descriptions must be followed to receive full credit for your work. All assignments will be turned in through the assignment tab in Canvas.

SafeAssign is a tool that will be used to check a document for plagiarism. The tool provides feedback as to whether or not the text in a document is a close match with other documents on the Internet, in journal databases, via AI, and submitted to Canvas. If a student is caught plagiarizing, a grade of zero will be given as well as a disposition for cheating.

Dispositions - All students in the UT Tyler Teacher Preparation Program must adhere to the professional behaviors outlined in the UT Tyler School of Education Dispositions.

The Use of Artificial Intelligence: Generative artificial intelligence (AI) like the software ChatGPT is now widely available to produce text, images, and other media. It is important to keep the following in mind: (1) An AI cannot pass this course; (2) Intellectual honesty is vital to the academic community and for my fair evaluation of your work, all work submitted in this course must be your own, completed in accordance with the University's academic regulations; (3) You must obtain permission from me before using AI composition software (like ChatGPT) for any assignments in this course. Using these tools without my permission puts your academic integrity at risk. When content is produced by an artificial intelligence tool, it must be cited appropriately.

Planned Topical Outline:

Date	Topic/Readings	Assignments
Lesson 1 Jan. 13-17	**Getting Started** Readings: Assigned	• Online Assignments: Log on to Canvas and review syllabus. Quiz • Facebook group introductions
Lesson 2 Jan. 20-24	**Constructionism and Playful Learning** Readings: Assigned	• Reading Reflections • Logo/Turtle Project
Lesson 3 Jan. 27-31	**Power of Ideas** Readings: Assigned	• Reading Reflections • Loose Part Project
Lessons 4-5 Feb. 3-14	**Making** Readings: Assigned	• Reading Reflections • Makey-Makey Projects
Lessons 6-7 Feb 17-28	**Coding** Readings: Assigned	• Reading Reflections • 3 Coding Assignments • Coding Project
Lessons 8-13 Mar 3-April 18	**Welcome to Spike** Readings: Assigned *Note: March 17-21 Spring Break	• Getting Started with SPIKE Prime • Building an Industrial Robot Claw • Building a LEGO Guitar • Building a Mechanical Bird • Building a Sumobot • Building a Dragster • Building a Simon Says Game
Lesson 14 April 21-25	**3D Printing** Readings: Assigned	• Reading Reflection • 3D Printing Project
Final April 28	**Final Project** Readings: Assigned	• Turn in Spike Robots • Final Project Due- April 28, 2025

*Dates to remember:

- January 20, 2025: Martin Luther King Holiday
- January 27, 2025: Census Date
- March 17-21, 2025: Spring Break
- March 31, 2025: Drop Date
- May 2, 2025: Semester Ends

UNIVERSITY POLICIES

UT Tyler Honor Code
Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

For a full list of university policies including information related to the topics listed below, click here.

- Students Rights and Responsibilities
- Campus Carry
- Tobacco-Free University
- Grade Replacement/Forgiveness and Census Date Policies
- State-Mandated Course Drop Policy
- Disability Services
- Student Absence due to Religious Observance
- Student Absence for University-Sponsored Events and Activities
- Social Security and FERPA Statement
- Emergency Exits and Evacuation
- Student Standards of Academic Conduct

UT Tyler Resources for Students:

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu, http://www.uttyler.edu/writingcenter/
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu, https://www.uttyler.edu/tutoring/
- The Mathematics Learning Center, RBN 4021, This is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254) https://www.uttyler.edu/counseling/

University Guidelines, Links and Policies

COLLEGE OF EDUCATION AND PSYCHOLOGY (CEP) VISION AND MISSION

Vision: The College of Education and Psychology is nationally recognized and respected for its academic programs and opportunities. It is a center of academic excellence, scholarly inquiry, and public service. The College prepares leaders to meet the critical challenges of the 21st Century through productive contributions to local and global communities and toward individual and cultural equity.

Mission: The mission of the College of Education and Psychology is to provide a positive environment that fosters the acquisition of knowledge and skills. The mission is individually and collectively realized through a community of scholars that contributes to knowledge through scholarly inquiry; organizes knowledge for application, understanding and communication; and provides leadership and service. We affirm and promote global perspectives that value individual and cultural diversity to enhance learning, service, and scholarship.

UT TYLER'S SCHOOL OF EDUCATION STANDARDS FOR EDUCATOR PREPARATION PROGRAMS

Texas Education Standards: The School of Education are committed to teaching and implementing the Texas Educator Standards at the highest level. The School of Education faculty use the Texas Education Standards, along with the Interstate New Teacher Assessment and Support Consortium (InTASC) standards used by educator preparation programs throughout the United States.

Access the Code of Ethics and Standard Practices for Texas Educators.