

**EDCI 5333.060**  
**INNOVATION, SCIENCE, AND TECHNOLOGY APPLICATIONS**  
**Spring 2020 Syllabus**

**Instructor**  
**Information:**

Dr. Julie Delello, Associate Professor  
School of Education  
The University of Texas at Tyler  
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Office: BEP 235  
Office Hours: Wednesday- 9:00 AM-12:00 PM  
and by appointment  
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**Course Description:**

This graduate course is designed to introduce students to the essentials of creativity, design and engineering through the use of 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.

**Student Learning Outcomes:**

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, 10)
- 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 world (INTASC Standards: 1, 6, 9, 10)
- Use innovative technologies to facilitate and inspire student learning and creativity (INTASC Standards: 1, 3, 6, 9, 10)

**Evaluation and Grading:** 12 Reading Assignments/Discussions (10-25 Points Each)  
6 Project-Based Applications (20-50 Points Each)

3 Major Projects (100 Points Each): Coding, Robot, 3D Printing

**Teaching Strategies:**

Lecture, model lessons, project-based learning, writing-based assignments, collaboration, reflection, discussions, assigned readings, and social media applications.

**Required Texts:**

***LEGO MINDSTORMS EV3 Discovery Book: A Beginner's Guide to Building and Programming Robots.*** Laurens Valk. June 2014, 396 pp. ISBN: 978-1-59327-532-7

**The Most Magnificent Thing.** Ashley Spires. April 2014, 32 pp. ISBN: 1554537045.

**Assigned Readings**

*Note: A student from this institution is not under any obligation to purchase or rent a textbook from a university-affiliated bookstore.*

**Required Supplies:**

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

Lego Mindstorms EV3 Core Robotics Set (this kit may be purchased directly from Lego or borrowed from the School of Education). This kit is not available at a 3<sup>rd</sup> party retailer (e.g. Amazon).

**Technology Access**

This is an online course and will require reliable technology.

Required technology includes:

**Hardware:**

- Desktop or Laptop computer with Internet access.
  - Note: If your Internet connection is down, it is your responsibility to seek access at a venue such as in the UTT computer lab (e.g. BEP 249 or HPR 134), a public library to complete and submit your work on time.
- 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.utt Tyler.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)

## **Technical Support:**

**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](mailto:itsupport@patriots.uttyler.edu). If you need Canvas support, see <https://www.uttyler.edu/canvas/>.

In your email be sure to include:

- The title and number of the course
- The Canvas page in question
- A description and message number for any error message that you receive
- What you were doing at the time you got the error message

## **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.

**3. 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 me prior to the due date at [jdelello@uttyler.edu](mailto:jdelello@uttyler.edu).** Please allow up to 48 hours for response to an email.

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

**5. Turn it In** 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, and submitted to Canvas. *If a student is caught plagiarizing, a grade of zero will be given as well as a disposition for cheating.*

**6. 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. These dispositions are listed at the following website:  
<http://www.uttyler.edu/education/documents/Dispositions.pdf>

**Planned Topical Outline:**

Date	Topic/Readings	Assignments
<b>Lesson 1</b> January 13-17	<b>Getting Started</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Online Assignments: Log on to Canvas and review syllabus. Quiz (20 pts)</li> <li>Facebook group introductions</li> </ul>
<b>Lesson 2</b> January 20-24	<b>Constructionism and Playful Learning</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Reading Reflections (18 pts)</li> <li>• Logo/Turtle Project (25 pts)</li> </ul>
<b>Lesson 3</b> January 27-31	<b>Power of Ideas</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Reading Reflections (20 pts)</li> <li>• Loose Part Project (50 pts)</li> </ul>
<b>Lessons 4-5</b> Feb 3-14	<b>Making</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Reading Reflections (28 pts)</li> <li>• Makey-Makey Projects (25 pts)</li> </ul>
<b>Lessons 6-7</b> Feb 17-28	<b>Coding</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Reading Reflections (30 pts)</li> <li>• 3 Coding Assignments (20 pts)</li> <li>• Coding Project (100 pts)</li> </ul>
<b>Lessons 8-13</b> March 2-6 * March 16-20 March 23-27 March 30- April 3 April 6-10 April 13-17	<b>Welcome to EV</b> Readings: Assigned  *Note: March 9-13 Spring Break	<ul style="list-style-type: none"> <li>• Week 8: Getting Started (20 pts)</li> <li>• Week 9: On Brick APPS/Lobby (25 pts)</li> <li>Bits and Bricks (10 pts)</li> <li>Brick Model Video (25 pts)</li> <li>• Week 10-11: Move Blocks (20 pts)</li> <li>Move Block Video (25 pts)</li> <li>• Week 12: Drones (26 pts)</li> <li>Code Block (10 pts)</li> <li>Robot Dance (25 pts)</li> <li>• Week 13: Sensors (20 pts)</li> <li>Robot build (100 pts)</li> </ul>
Lesson 14 April 20-24	<b>3D Printing</b> Readings: Assigned	<ul style="list-style-type: none"> <li>• Reading Reflection (20 pts)</li> <li>• 3D Printing Project (100 pts)</li> </ul>
<b>Lesson 15</b> April 28	Readings: Assigned	<ul style="list-style-type: none"> <li>• Turn in EV3 Robots</li> <li>• <b>Final Project Due</b></li> </ul>

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\*Dates to remember:

- January 20, 2020: Martin Luther King Holiday
- January 27, 2020: Census Date
- March 9-13, 2020: Spring Break
- March 30, 2020: Drop Date
- April 30, 2020: 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](mailto:writingcenter@uttyler.edu), <http://www.uttyler.edu/writingcenter/>
- UT Tyler Tutoring Center (903.565.5964), [tutoring@uttyler.edu](mailto: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

21<sup>st</sup> 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.

The list of [Texas Education Standards](#) can be accessed [here](#).

*Access the [Code of Ethics and Standard Practices for Texas Educators](#).*