



### Course Syllabus

EDTC 5630-02	Advanced Topics in Classroom Technologies <b>Robotics in the Classroom</b>	Sum. 2008 – Tues / Thurs July 8, 10, 15, 17 9-4
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#### 1. COURSE DESCRIPTION:

In this class students will build a TechCard chassis-based robot using principles of basic electronics. Students will create a robot that is aesthetically pleasing and one that solves a real-world problem and does something. Students will examine how incorporating robotics technology into pre-existing lesson plans will create investigative play through the design of meaningful projects, encourage group participation, enhance social skills, increase comprehension, retention, and thinking and learning skills. Students will examine and discuss how robot building involves probability, planning and predicting, designing, hypothesizing, measuring, and applying mathematical and scientific principles. Students will access the Internet to search for and examine robotic sites that include NASA robotic information, robotic games and activities for age appropriate classroom use, and to print items such as a paper ruler that will be used to convert to and from metric and imperial systems of measurement.

Discussions will include how robotics relate to education, how to incorporate robotics into existing lesson plans to enrich and expand on already existing lessons at any grade level in multiple disciplines. Kits, pre-built robots, and mechanical aspects of beginning robotics, will be discussed. Students will become adept at purchasing products from various sources.

#### 2. LEARNING OUTCOMES:

At the end of this class students will:

- examine and explain to an age appropriate classroom, the three elements of a robot (ISTE 1, 2, 3, 4, 5, 6)
- analyze the history of robots and discuss the Russian/American scientist and author, Isaac Asimov (ISTE 1, 2, 3, 4, 5, 6)
- explain the value of robots in everyday life, in Hollywood, and in space (ISTE 1, 2, 3, 4, 5, 6)
- compare and contrast artificial intelligence robots, vehicular robots, micro robots, nanobots, and humanoids, and spider bots (ISTE 1, 2, 3, 4, 5, 6)
- explain and demonstrate the use of gears, wheels, chassis, motors, sensors, batteries, switches
- examine various uses of Legos in classrooms (ISTE 1, 2, 3, 4, 5, 6)
- create a lesson plan incorporating technology robotics in a classroom within a discipline (ISTE 1, 2, 3, 4, 5, 6)
- design and create a working chassis-based robot (ISTE 1, 2, 3, 4, 5, 6)
- design a method for analyzing and evaluating a finished product (ISTE 1, 2, 3, 4, 5, 6)

- examine how to successfully group students to build a chassis-based robot (ISTE 1, 2, 3, 4, 5, 6)
- discuss and examine various outlets for purchasing robotic supplies (ISTE 1, 2, 3, 4, 5, 6)

3. **SCHEDULE OF REQUIRED READINGS, CLASS PREPARATIONS AND ASSIGNMENTS, LECTURES, DISCUSSIONS, STUDENT PRESENTATIONS, OUT-OF-CLASS ASSIGNMENTS AND EXAMS.**

<b>Module 1</b>	<b>July 6</b>	<b>Intro to class, to robotics, to kit, to tools and supplies, various energy forms</b> (electric, wind/air, programmable using string, wind/air combos using propellers, solar, and pneumatic), <b>bounce bot assembly</b> for intermediate aged students, <b>demo of and then search for age appropriate worksheets</b> for classroom students to use during down-times (glue drying, etc.), <b>why robotics in the classroom</b> , discussion of <b>history of robots, what they are, how robotics work with curriculum content</b> , short <b>video of robotics in classrooms</b>
		<b>Wind/ air, no electric motor robot</b> - assembly of balloon chassis based robot for younger students, demo of and then search for age appropriate worksheets for classroom students to use during down-times (glue drying, etc.)
<b>Module 3</b>	<b>July 13</b>	<b>Discussion on programmable electric motor robot</b> - assembly of simple string programmable motor chassis robot for older students, demo of and then search for age appropriate worksheets for classroom students to use during down-times (glue drying, etc.)  <b>Midterm and final project:</b> this will be a combination of several activities and it will culminate in an oral presentation on the last night of class.  Midterm and final projects include: <ul style="list-style-type: none"> <li>• create a short lesson plan for students that involve building a robot</li> <li>• build the robot from your kit or one you found on the Internet, or use a robot that you've already built</li> <li>• if you are going to use a robot that you already built then create two downtime activity sheets, if you are going to create a new robot then create one activity sheet</li> <li>• create a check list or rubric to assess your students robot that they will build</li> </ul>
<b>Module 4</b>	<b>July 20</b>	<b>Discussion on wind / air combo robot</b> – assembly of propeller / electric motor driven chassis based robot for intermediate aged students, demo of and then search for age appropriate worksheets for classroom students to use during down-times (glue drying, etc.)
<b>Module 5</b>		<b>Discussion on solar power projects and kits</b> – experiment with various kits and solar power, demo of and then search for age appropriate worksheets for classroom students to use

		during down-times (glue drying, etc.)  <b>Pneumatic power</b> – assembly of pneumatic dump truck, demo of and then search for age appropriate worksheets for classroom students to use during down-times (glue drying, etc.) –
<b>Module 6</b>	<b>July 27</b>	<b>Assessing in robotics and final project presentation</b> <b>Final project</b> - create any robot from the kit and a method to assess and present orally

4. **RESOURCES:**

**Required Text(s):** Required **Ultimate Robot Kit**, ISBN: 0789479451, **Publisher:** DK Publishing, Inc. Approximate \$25.99. There is a small text and it is included in the kit. If this kit is not available at the Webster Campus Book Store, please purchase it through another sources such as Borders, Amazon.com, or Barnes and Nobel.

Various Internet readings as assigned throughout the course.

5. **EVALUATION / GRADING SCALE:**

- 93-100 = A
- 90-92 = A-
- 86-89 = B+
- 83-85 = B
- 80-82 = B-
- 76-79 = C+

Weekly Readings and Discussion (6 classes x 2 = 12 points possible)	12
Class attendance (2 points for every full class in attendance = 6 x 2 = 12 points possible)	12
6 weekly assignments / projects / activities (6 classes x 6 = 36 points possible)	36
Midterm	20
Final project	20

All academic and professional behavior of students in this course is subject to review for the purposes of student evaluation.

**I plan to keep the final project. So if you desire a copy of it, please make one for yourself before turning it into me.**

6. **ACADEMIC HONESTY POLICY:**

**Students at Webster University are expected to practice academic honesty.**

In its broadest sense, plagiarism is using someone else's work or ideas, presented or claimed as your own. Any time you refer to another person's work, whether as a direct quotation or paraphrased, you must use a citation. Students should not copy more than two paragraphs from any source as a major component of papers or projects. All citations must be properly documented and references must be provided using APA guidelines (<http://library.webster.edu/citation.html>).

7. **ACCESSIBILITY/ACCOMODATIONS POLICY:**

If you have a disability, please notify your instructor as soon as possible to discuss your accommodation needs.

8. **ATTENDANCE:**

Attendance at all classes is required. If a student anticipates missing a class, the instructor must be notified prior to the class. Students will be required to complete the work assigned and to make up any missed work by the next class. **Please note that we only meet 8 days, hence each meeting is crucial. The instructor reserves the right to lower the final grade by a letter grade for absences.**

Students who do not complete the requirements of the course must contact the instructor prior to the end of the course to complete an Incomplete Course form. Incompletes are not awarded except in emergencies, as defined by the instructor.

**NB: An Incomplete may only be awarded to a student who has maintained a passing grade up to the point of the emergency. Incomplete grades will change to a grade of F or NC unless the requirements stipulated on the incomplete form are met by the date listed on the form or one calendar year from the end of the course, whichever comes first.**

9. **OTHER**

**Expectations:** EDTC 5330 is a graduate class. A graduate class includes readings from the textbook as well as library articles. It is expected that the students will write as part of the course requirements. In the final project not only the technical requirements of the assignment must be met, it is expected that there will be considerable writing involved in proposal that is designed. Further writing is expected on the discussion list each week based upon the readings assigned. Finally, the final project proposal must stipulate how it will be used within the school.

10. **STANDARDS / GOALS:**

International Society for Technology in Education (**ISTE**) - National Educational Technology Standards for Teachers (**NETS**) – [http://cnets.iste.org/teachers/t\\_stands.html](http://cnets.iste.org/teachers/t_stands.html)

**ISTE NET Standards:**

**1. Technology operations and concepts.**

Teachers demonstrate a sound understanding of technology operations and concepts.

**2. Planning and designing learning environments and experiences.**

Teachers plan and design effective learning environments and experiences supported by technology.

**3. Teaching, learning, and the curriculum.**

Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning.

**4. Assessment and evaluation.**

Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies.

**5. Productivity and professional practice.**

Teachers use technology to enhance their productivity and professional practice.

**6. Social, ethical, legal, and human issues.**

Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply those principles in practice.

**The School of Education (SOE) Goals:**

**1. The knowledgeable learner:**

Education candidates will demonstrate knowledge of the subject matter, knowledge of the learner, and knowledge of pedagogy based on inquiry and scholarship.

**2. The informed instructor:**

Education candidates will incorporate multiple assessment and instructional strategies to support effective educational practices based on research and theory.

**3. The reflective collaborator:**

Education candidates will reflect on the roles educators take as leaders of change through collaboration with colleagues, students, and families in schools and communities.

**4. The responsive educator:**

Education candidates will demonstrate respect for diversity through responsive teaching and learning that values individual differences.

*This syllabus is subject to change at the discretion of the instructor.*