EGR 599|EDU 300: Robotics
Summer 2016 SYLLABUS

“Research and Reflection for Learning and Leading”

“...In the era of standardized testing, I think we are losing sight of the main goal of education in my mind—to teach students how to learn on their own. We need to teach students how to be curious and ask a question, how to frame the question, how to research the question, how to validate their answer to the question, and how to communicate that answer to others. This has little to do with the content and a lot to do with the approach. ... There is nothing more rewarding than having a group of middle school students come back to the classroom during recess so that they can further investigate the complexities of torque or energy transfer (a common occurrence in Barbara’s class). That is when you know things are going right. Students (of all ages) should be excited to go to school and learn—...”

-Chris Rogers, Tufts Center for Engineering Education Outreach, in Introduction to Physics by Design by Barbara Bratzel

"...With video games, kids will go back and do it a hundred times. They'll fail until they win...Failure in an academic environment is depressing. Failure in a video game is completely aspirational..."

-New York Times 9/19/10,"Video Games Win a Beachhead in the Classroom"

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Margaret Mohr-Schroeder and Bruce Walcott</th>
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<tbody>
<tr>
<td>Office Hours/Location:</td>
<td>Office hours by appointment/ 105 Taylor Education Building</td>
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<td>Virtual Office Hours</td>
<td>Arranged individually through email; Adobe Connect and Skype access also available</td>
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<td>Preferred method for contacting instructor</td>
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<td>Anticipated Response Time</td>
<td>48 hours</td>
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<tr>
<td>Technological Requirements</td>
<td>Computer with Internet access and VPN or access to UK computer facilities, webcam with microphone headset</td>
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<td>For</td>
<td>Contact TASC at <a href="http://www.uky.edu/TASC">http://www.uky.edu/TASC</a> or call 859.257.8272</td>
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UK College of Education Professional Themes
This course will address the four themes of the conceptual framework for the UK professional education unit: research, reflection, learning, and leading. Students will be given the opportunity to review, analyze, discuss, and apply research from diverse perspectives in education, including professional scholarship and practitioner inquiry, in order to reflect on their own practices as they study, observe, and practice in P-12 school and university classrooms. Reflection will also be integrated into students’ learning opportunities through the production of written essays and analyses of observation and teaching experiences to help students take advantage of the analytical and problem-solving skills that comprise critical professional reflection on one’s own teaching. This course emphasizes the commitment of the professional education unit to ensure that its graduates move into their professional lives equipped for life-long learning as educators who will be active in leading colleagues in their schools, districts, and professional organizations. The ultimate goal in addressing these four themes is to produce teacher leaders who work together to improve student learning among diverse populations and improve education in Kentucky and beyond.

Course Overview/Objectives:

Course Overview:
EDU 300/EGR 599 will introduce students to the fundamental concepts of robots and give them the opportunity to explore robots, engineering concepts, engineering design, robotics curricular materials for K12 students, ethical concerns with robots, and assessing in the classroom. Topics include how robots move, sense, and perceive the world around them. Students will construct and program robots. No previous computer programming or electronics experience is necessary!!

Student Learning Outcomes:
• Gain familiarity with the interdisciplinary field of robotics and its growing impact on
society.

- Develop the ability to direct robots using computer languages for communication.
- Become familiar with widely used computer programming constructs including variables, assignment, looping, and conditional statements.
- Gained aptitude in understanding, designing, and evaluating patterns of logic and reasoning expressed as algorithms.
- Learn to practice argumentation and reflection on topics related to disciplinary content, including ethics.
- Have become more comfortable and effective working in a team setting, particularly in analyzing and communicating logical and computational ideas with others.

**Course Delivery**

This course is designed as a hybrid course. Course participants will attend class on campus and will participate in online discussions, collaborate on group projects, and work on independent research projects during the distance learning segment of the course.

**Course Assessment Tasks**

*The following assessments align with the Kentucky Teacher (Advanced) Standards, NCATE/NCTM Standards, NCATE/NSTA Standards, Kentucky Core Academic Standards, University of Kentucky Teacher Leader Standards, University of Kentucky Action Research Standards, University of Kentucky Functional Skills and Dispositions, University of Kentucky Technology Standards, ISTE, and EPSB themes.*

Assignments must be submitted on or before the due dates given in the course schedule. **Five percent will be deducted from the value of an assignment for each day it is late,** unless prior arrangements have been made with the instructor. Full descriptions of these assignments and evaluation rubrics for each are appended to this syllabus. Major course tasks are as follows:

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<th>Task</th>
<th>Task Description</th>
<th>Standards Alignment</th>
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| See Blue STEM Camp | Through service outreach experiences, the class will introduce robots to rising middle school students during the See Blue STEM Camp. Each student in the course is required to commit in advance and to fully participate in the camp. The dates this year are June 8-12. Food and snacks are provided. | UKTLS 3  
FSD 1  
COET 1,2,3,4  
KTS 1,2,6  
NCATE/NCTM 4  
NCATE/NSTA 4 |
| Reflections        | Students will write critical or reflective responses to primary readings; write reflections on course assignments and in-class discussions and activities; participate in oral discussion - individual or group; participate in online discussions; share presentations - individual, group or both. | KTS 8, 10  
UKTLS 2  
FSD 1,3,5 |
Robots Coding Assignments

Students will be expected to spend at least 20 hours coding and completing challenges prior to the See Blue STEM Camp. Students will be asked to submit video of the challenges if they are not completed during the course.

KTS 1, 2, 6, 10
UKTLS 1, 3, 4, 5, 7
FSD 1, 3
COET 1, 2, 3, 4, 5, 6
NCATE/NCTM 4
NCATE/NSTA 1, 4, 5, 6, 8

Course Grading

Grading scale for undergraduates:
- 90 – 100% = A
- 80 – 89% = B
- 70 – 79% = C
- 60 – 69% = D
- Below 60% = E

Grading scale for graduate students:
- 90-100% = A
- 80 – 89% = B
- 70 – 79% = C
- Below 70% = E

Course Policies

Addressing Themes of Diversity, Assessment, and Technology

All UK professional education programs address and affirm the value of diversity in education, the use of technology to support all aspects of instructional programming, and the importance of attaining high levels of skill in assessing the outcomes of instruction. This course will provide students an opportunity to demonstrate attention to these themes and reflect on the mechanisms that this course has provided to demonstrate improved skills in these areas.

Attendance

Attendance of individuals in the class is required, and university rules regarding absences will be followed. Exchange of ideas is essential for the learning that occurs in this class. In most class meetings, students work in pairs and/or in groups. The absence of one individual affects the performance of all persons working in the group. If you are absent, it is each student’s responsibility to make up the work and provide evidence that the absence was excused. Without this evidence, the absence will be considered unexcused. Two tardies, whether arriving late or leaving early, equals one unexcused absence. I reserve the right to lower your final grade one letter grade your grade for each unexcused absence.

Students need to notify the professor of absences prior to class when possible. Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor.
Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php.

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.

Per Senate Rule 5.2.4.2, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

Verification of Absences
Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

Participation and Professionalism
Evidence of professional dedication will be expected throughout this course and in all course-related interactions. Credit for participation and professionalism will be part of the evaluation. This means, in part, that we expect your regular, punctual attendance and participation. If you miss a class for any reason, it is your responsibility to contact the instructor and to make up any work.

Attendance, Participation, and Professionalism together
1. Students will attend all class meetings and field placement sessions.
2. Students will complete all assignments prior to scheduled discussions and due dates (see course calendar).
3. Students will attend all class meetings and be active participants.
   a. Active participation may include: verbal participation in discussions, asking questions or responding to peers or instructor in constructive ways, clearly demonstrating active listening (taking notes, paying attention, etc.), and communicating with the instructor via office meetings and/or email.
4. Absences will be communicated in advance and in writing to the instructor, or will do so as soon as possible.
   a. It is the student’s responsibility to pursue make-up work and collect materials and information from missed class meetings.

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b. Students will conduct themselves in a professional and ethical manner.

c. They will be punctual, presentable, respectful of peers and instructors, and they will be honest in their academic efforts.

d. They will attend to and engage course materials to learn and improve their knowledge, understanding, and practice as teachers.

5. Attendance, participation, and professionalism will be assessed holistically based on the above criteria, and will be used to determine the outcome of borderline grades.

6. Students are encouraged to communicate regularly with the instructor so that they are aware of their standing.

7. Students who fail to attend class, participate as expected, and/or conduct themselves professionally or ethically will be required to meet with the instructor to set improvement goals.

8. Poor conduct or lack of participation may negatively affect their course grades.

9. In cases of extreme or frequent misconduct, the instructor reserves the right to dismiss a student from class and notify the department and college for potential disciplinary action.

10. In non-emergency situations, late work will not be accepted without prior arrangements with the instructor.

   a. The instructor reserves the right to refuse late work or to accept late work for reduced credit unless the student has made prior arrangements with the instructor.

**Students with Special Needs**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is [http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/](http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/).

The course will be conducted with openness and respect to all individuals’ points of view and experience. The activities and discussions will not tolerate discrimination or prejudice toward any person or group’s religion, ethnicity, disability, gender, or sexual orientation.

**Classroom Behavior, Decorum, and Civility (aka, Ethics Statement)**

This course and its participants will not tolerate discrimination, violence, or vandalism. EDC is an open and affirming department for all people, including those who are subjected to racial profiling, hate crimes, heterosexism, and violence. We insist that appropriate action be taken against those who perpetrate discrimination, violence, or vandalism. The University of Kentucky is an Affirmative Action and Equal Opportunity institution and affirms its dedication to non-discrimination on the basis of race, color, religion, gender, age, sexual orientation, domestic partner status, national origin, or disability in employment, programs, and services.
Our commitment to non-discrimination and affirmation action embraces the entire university community including faculty, staff, and students.

All students are expected to conduct themselves in an appropriate and ethical manner during their UK classes and related field placements, as befitting graduate students, future teachers, and ambassadors for the University of Kentucky. Any unethical behavior in class may result in failure for the course and/or expulsion from the program, determined on a case-by-case basis. Faculty will follow all university due process procedures in cases of academic or ethical misconduct. Please consult the instructor if you have questions regarding this requirement.

**Statement on Plagiarism**
All materials generated for this class (which may include but are not limited to syllabi and in-class materials) are copyrighted. You do not have the right to copy such materials unless the professor or assistant expressly grants permission. As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have permission of that person. Plagiarism is one of the worst academic violations, for the plagiarist destroys trust among others. Thus, plagiarism will not be tolerated.

It is expected that you will do your own work and give others credit for work that is used within your own writing. The *American Psychological Association (APA) Publication Manual, 5th edition*, is the style guide most often used in educational research. It is expected that you will follow the APA styling for formatting, writing references, and making citations within text. An abbreviated APA style guide can be found at [The Owl at Purdue](http://owl.english.purdue.edu/owl/resource/560/01/) or from the University of Kentucky Education Library located on the second floor of Dickey Hall. *Further, cheating and plagiarism are serious university and academic offences. The minimum consequence of either offence is a failing grade in the course.* Additional university penalties also may apply, depending upon the circumstances of the case. Please submit original work and provide complete references for any information used from other sources.

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: [http://www.uky.edu/Ombud](http://www.uky.edu/Ombud). A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.
Senate Rules 6.3.1 (see http://www.uky.edu/Faculty/Senate/ for the current set of Senate Rules) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Commitment to Diversity
The UK Department of STEM Education is committed to: making diversity central to policies, decisions, and practices; evaluating progress toward diversity in the program; disseminating results widely; and using these results to strengthen diversity for the Commonwealth.

Equitable access to high quality instruction in Kentucky’s secondary schools is directly and indirectly affected by this department’s beliefs in and support for social diversity in schools. Moreover, the Commonwealth is directly affected by the ability of its youth to acquire high levels of skill that can then be used by them as citizens to enhance their communities and participate in the state’s ongoing progress and prosperity in local, regional, national, and global contexts. Therefore, it is essential for our students to understand issues related to social diversity and make a commitment to value diversity as they engaged in teaching, research, reflection, learning, and leadership. By valuing diversity, our program is committed to enabling and empowering all people in educational contexts regardless of their race, ethnicity, gender, social class, sexual orientation, domestic partner status, and so forth.
Commitment to Addressing the Achievement Gap
The UK Department of Curriculum and Instruction aligns itself with the positions of the NCTM, NCSS, NSTA, and NCTE regarding cultural and linguistic diversity. The program seeks to underscore that cultural and linguistic diversity should be treated as integral components of public education, and that the failure to accommodate such diversity in curriculum and instruction contributes to disparities in student achievement across racial populations—a phenomenon popularly referred to as “the achievement gap.”

Commitment to Technology
The UK Department of Curriculum and Instruction is committed to teaching students so they use technology as a personal and professional tool. Our program is guided by NCATE standards, UK College of Education Technology Standards, EPSB Teacher Standards, and SPA Standards as they relate to technology. Students are required to use technology for a majority of their classes. Students use technology for class assignments, lesson plan design and preparation, class presentations, record keeping, and data analysis. Students are required to successfully complete course work focusing on using technology. Our students are required to communicate via electronic mail, use list serves, access the Internet and online databases, and use digital texts and modes for research projects and presentations. Our students use Microsoft Word, Excel, Access, and PowerPoint. They are given multiple opportunities during student teaching to videotape their teaching for use in self-analysis toward professional development. Our program offers students access to “smart” classrooms and technology labs in order to further facilitate their use of technology.

Course Texts:
The following texts align with the Kentucky Teacher (Advanced) Standards, NCATE/NCTM Standards, NCATE/NSTA Standards, Kentucky Core Academic Standards (as they become available), University of Kentucky Teacher Leader Standards, University of Kentucky Action Research Standards, University of Kentucky Functional Skills and Dispositions, ISTE, and EPSB themes, KY Learner Goals and Expectations, Program of Studies and Core Content – online documents (or their replacements as they become available), Subject-area Professional Association (SPA) K-12 standards, and Common Core Standards and their related documents (www.commoncore.org)

*The Case of the Killer Robot: Stories about the Professional, Ethical, and Societal Dimensions of Computing* by RG Epstein


Common Core State Standards for Mathematics and English Language Arts: 
http://www.corestandards.org/the-standards

Other readings will be made available via Canvas