Stephen F. Austin State University

EGR 475 – Special Problems (Elective)

Course Description:
Experimental and theoretical independent study in research. Not available for graduate credit. Prerequisite: 12 semester hours of engineering or physics. 3 credit hours.

Prerequisites: 12 semester hours of engineering or physics

Co-Requisites: None

Credits: 3 Hours (Lecture: 3 Hours)

Instructor: Christopher J. Aul

Textbook: None

Supplemental Materials: None

Topics Covered:
Engineering design, project planning, CAD, dimensioning and tolerances, fabrication methods, experimental testing, reporting of technical information.

Course Learning Outcomes
By the end of the course, a successful student will be able to:
1. Design an appropriate solution to the prescribed work. (SO-2)
2. Apply principles in engineering design to evaluate concept and final design. (SO-1)
3. Reference up-to-date engineering designs developed for similar applications. (SO-4)
4. Describe overall design choices in a comprehensive written report. (SO-3)
5. Test the experimental design and record results against requirements of project. (SO-6)

Student Outcomes
Graduates of the program will show:
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Course Outline:

Engineering 475 – Fall 2019
Adding VEX Capability to STEM Education Project

Department of Physics and Astronomy, Stephen F. Austin State University

Instructor: Christopher J. Aul, PhD
Email: aulcj@sfasu.edu
Office: 207D Ed & Gwen Cole STEM Building
Office Hours: MR 9-11am, or by appointment
Class Meetings: Thursdays 12:15-1:15pm
Course Home Page: http://d2l.sfasu.edu

Course Description:
Experimental and theoretical independent study in research. Not available for graduate credit.
Prerequisite: 12 semester hours of engineering or physics. 3 credit hours.

Text and Materials:
The materials and equipment required for this course will be supplied to the student.

Course Requirements:

Objectives
1. Learn VEX robotics system – both physical assembly and coding
2. Apply VEX robotics system to perform simple tasks and demo capability to engineering faculty
3. Review STEM outreach module and review how it is applied to Lego EV3 kits
4. Apply same STEM outreach module to VEX robotics system
5. Write up tutorial on how to program VEX robotics system – targeted at high school outreach
6. Demonstrate VEX capability to engineering faculty covering the new STEM outreach module

Requirements
1. Ability to learn outside of class meetings – need to review programming languages used for VEX system
2. Create tutorials and presentation on use of VEX system for STEM outreach module
3. Take pictures and create illustrations like those already established in Lego EV3 STEM outreach module

Course Calendar:
Calendar is tentative and subject to change. It is required that the student spend at least 2 hours for every hour of the course outside of class in personal study. This equates to 6 hours for a 3 hour course, 4 hours for a 2 hour course, and 2 hours for a 1 hour course. This will be largely paced by the student but weekly updates will be presented to the instructor during class meeting times.

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<tr>
<th>Week(s)</th>
<th>Milestone or Event</th>
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<tr>
<td>1-5</td>
<td>Learn VEX robotics system and demo using both object oriented and text programming to engineering faculty (Date: 9/27/19)</td>
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<tr>
<td>6-7</td>
<td>Review current STEM outreach module using Lego EV3 kits and translate into requirements for VEX system</td>
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<tr>
<td>8-10</td>
<td>Create tutorial write-up and presentation slides for similar activities (to Lego EV3 kit module) using VEX system</td>
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<tr>
<td>11-14</td>
<td>Demonstrate new STEM outreach module using VEX system to engineering faculty (Date: 12/6/19)</td>
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Grading Policy:
The grading for this course comes purely from the design reports due throughout the semester. It is the responsibility of the student to meet with the instructor throughout the semester to determine the grading criteria for the design reports. Letter grades are based on the following ranges:
A: 90.0 – 100, B: 80.0 - 89.9, C: 70.0 - 79.9, D: 60.0 - 69.9, F: 0 - 59.9.

Attendance Policy:
All absences must be made up to instructor. Meeting times are required and inability to make up any of the weekly meetings will result in failing of the course.

ABET a-k Student Outcomes
Graduates of the program will show:
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General Education Core Curriculum Objectives/Outcomes (EEO)
There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.
Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.