

Division: Technical

Subject Code: ELME

Course: 214

Course Title: Mechatronics Seminar and Advanced Project

Thaddeus Stevens College of Technology

Master Course Form

Catalog Description: This course provides a capstone experience for the AAS Degree in Electro-Mechanical Technology by requiring that the student, together with a team mate(s), apply skills and knowledge from each of the program areas to an independent mechatronics project. The student will develop and implement a project plan and budget approved by the instructor that will demonstrate the ability to integrate the skills and knowledge obtained over the previous three (3) semesters of study. The student will work with actual industrial equipment and machinery in a realistic application. This course will broaden the student's knowledge with respect to technology suppliers, equipment and applications. It is strongly suggested that the student and instructor begin planning for this course during the semester prior to the semester in which the course is completed.

Digital Description:

- Credit Hours: 4
- Lecture Hours: 2
- Lab Hours: 6

Prerequisites:

Minimum Grade Required - D

- ELME 204 - Mechanical Systems 3
- ELME 215 – Robotics and Motion Control
- ELME 208 – Industrial Programmable Logic Controllers 3

Corequisites:

- ELME 218, ELME 225

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Objectives:

Upon successful completion of the course, each student will be able to:

1. Understand and show mastery of the electro-mechanical field by completing a project incorporating the various elements of a complete mechatronic system.
2. Demonstrate knowledge in all aspects of previously covered Electro-mechanical coursework..
3. Use oral and written communications skills to document and communicate activities and results.
4. Demonstrate the ability to start-up and operate a mechatronic system
5. Demonstrate the ability to troubleshoot and repair a mechatronic system
6. Present and communicate the project results to others using Powerpoint
7. Interact with industry mentors (end users and technical representatives)
8. Apply sound costing methods

Competencies:

Upon successful completion of the course, each student will demonstrate the ability to:

1. Establish and communicate obtainable project objectives
2. Develop a work plan, budget and schedule
3. Communicate the work plan to the faculty advisor for approval
4. Implement the work plan
5. Use oral and written communications skills to document and communicate activities and results
6. Link the work plan to business objectives
7. Explain the relationship of the work plan to the environment, society and individual workers or consumers
8. Demonstrate teamwork and take shared responsibility for a task.
9. Demonstrate knowledge in each of the four (4) areas of mechatronics: mechanical engineering, electrical and electronic engineering, systems and process control engineering, and computer science
10. Integrate the four technical areas of mechatronics.
11. Design a mechatronic system using drawings, calculations and appropriate physical laws and properties
12. Specify components of a mechatronic system
13. Assemble a mechatronic system
14. Demonstrate the ability to program, calibrate and configure a mechatronic system
15. Demonstrate the ability to test the components of a mechatronic system
16. Demonstrate the ability to start-up and operate a mechatronic system
17. Demonstrate the ability to troubleshoot and repair a mechatronic system

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18. Create documentation for a mechatronic system from both a technical and operational perspective
19. Specify maintenance procedures for a mechatronic system
20. Perform a post completion audit of the project identifying the processes, procedures and technology that worked well and should be reinforced and those that went poorly and should be improved.
21. Present and communicate the project results to others using Powerpoint

List of Texts, References, Selected Library Resources or other Learning Materials:

All previous texts, lab equipment, simulations, and hardware will be drawn upon for this course. Industry provided material will also be drawn upon as required for each unique project.

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