University of Arkansas – Fort Smith
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General Syllabus

CGT 1894 - Robotics Concepts

Credit Hours: 4   **Lecture Hours:** 2   **Laboratory:** 4
Prerequisite: None
Prerequisite or Corequisite: None
Effective Semester: Summer I 2013

I. **Course Information**

  A. **Catalog Description**
   Provides students with hands-on experience in learning and exploring how robots are designed, constructed, and tested for authentic achievement of design goals.

  B. **Additional Information**
   None.

II. **Student Learning Outcomes**

  A. **Subject Matter**

   1. Brief introduction to robotics history and significant events timeline
   2. Basics of robot construction
   3. Engineering drawing software (AutoCAD, Autodesk Inventor, and/or Solid Works)
   4. Mechanical concepts (leverage, linkages, motion, etc.)
   5. Working within a team environment
   6. Detailed project documentation/engineering design process
   7. Analysis of design alternatives/problem-based learning
   8. Presentation skills
   9. Tool/Workplace safety
   10. Introduction to electrical systems and components

  B. **University Learning Outcomes**

   Quantitative Reasoning – Students will be required to use mathematical skills to determine speed of motion in relation to extension and angles of movements. Students will also be required to use common mathematical functions to determine proper sizes of parts of the robot.

   Technological Skills – Students will be required to use computer skills to create parametric **models** of robotic parts including animation of how those parts will function.

Communication Skills – Students will be required to create and maintain an engineering notebook throughout the class to annotate their process of discovery and experiments performed to arrive at a successful design.

III. Major Course Topics

A. Professional Knowledge

1. Create an Engineering notebook describing method of inquiry (based on the engineering design process) and results of each engineering test for functioning capability.
2. Analyze specific robotic functions and determine viable methods of accomplishing goals.
3. Collaboratively design, build, and test a robot capable of performing a specific task.

B. Visualization Skills

1. Function within a team setting to set and accomplish goals.
2. Use current computer parametric modeling software to create virtual robot parts and animate the functions of each part.