COURSE SYLLABUS

Tunxis Community College

Education That Works For a Lifetime

Course Title:	Robotics: Construction & Design	**Date submitted:**	March 2014 (AAC: 14-27)
Department:	Business and Technology		
Curriculum:	Engineer Science and Technology		

Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.

Course Code: (eg. ACC 101)	EGR*105
Course Type:	X

A: Clinical B: Lab D: Distance Learning
I: Individual/Independent L: Lecture N: Internship
M: Seminar P: Practicum U: Studio
X: Combined Lecture/Lab Y: Combined Lecture/Clinical/Lab Z: Combined Lecture/Studio

Elective Type:	G/LAS

AH: Art History E: English FA: Fine Arts FL: Foreign Language G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences M: Math S: Science SS: Social Science

Credit Hours:	4
Developmental: (yes/no)	N
Contact Hours: Lecture:	3
Clinical:	0
Lab:	3
Studio	0
Other:	0
TOTAL:	6
Class Maximum:	20
Semesters Offered:	F/Sp

Prerequisites:

None

Corequisites:

None

Other Requirements:

None

Catalog Course Description:

Explore the multidisciplinary world of robotics, and its relevance to current humanitarian, social, and environmental concerns. Modeling fields of science and engineering, this class will be based on teamwork and cooperative problem solving in a supportive, hands on, laboratory environment. Solutions to a series of challenges will be designed, constructed, tested, and revised by students working together in groups. A standard, modular, mobile robotics system will be used to design and construct robots capable of carrying out a single task or multiple tasks related to a variety of applications. The role of science, engineering and technology in modern society will also be explored.

Topical Outline: List course content in outline format.

This class follows a project based engineering problem solving format. The topics covered shall have an engineering or engineering technology focus and will be determined based upon the background and interest of the instructor. Some suggested topics follow:

1. Gear Ratios & Types
2. Gears versus Pulleys
3. Torque versus Speed

	4. Motors 5. Sensors, Touch, Ultrasonic, Sound, Vision, etc. 6. Boolean Logic, AND, OR, NOT 7. Programming 8. Structural Integrity 9. Microprocessor 10. Microcontrollers
Outcomes: Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.	**Upon successful completion of this course, the student will be able to do the following:** **COURSE:** 1. explain self-motivated learning inspired by challenging design, construction and programming problems 2. demonstrate the usefulness of scientific laws and engineering relationships in the construction and design of well-functioning robots 3. demonstrate basic programming skills such as precision in language, logical sequencing, use of conditional statements, and economy of design will be emphasized 4. show the value of teamwork and creative thinking in problem solving 5. explore the strengths and shortcomings of technological solutions to a variety of problems
	PROGRAM: *(Numbering reflects Program Outcomes as they appear in the college catalog)* **Engineering Science Associate Degree:** 3. analyze data and scientific information using critical-thinking skills and problem-solving techniques 7. use logic and organization when acquiring information, analyzing a situation, and solving problems
	GENERAL EDUCATION: *(Numbering reflects General Education Outcomes as they appear in the college catalog)* 9. **Scientific Reasoning -** Students will become familiar with science as a method of inquiry. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions . **Demonstrates**: Identifies and successfully executes components of the scientific method (hypothesis, procedure, observations, data analysis, and conclusions) to investigate real-world phenomena. **Does Not Demonstrate:** Misidentifies or poorly executes components of the scientific method (hypothesis, procedure, observations, data analysis, or conclusions) to investigate real-world phenomena.
Evaluation: List how the above outcomes will be assessed.	**Assessment will be based on the following criteria:** Quizzes Exams Laboratory Projects Laboratory Notebook

Instructional Resources: List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.	**Required:** Engineering Lab Robot Kits Software **Desired:**
Textbook(s)	Check with program coordinator for list of approved texts.