### Course Title:
Robotics: Construction & Design

### Department:
Business and Technology

### Curriculum:
Engineer Science and Technology

### Course Code:
EGR*105

### Course Type:
X

<table>
<thead>
<tr>
<th>Course Descriptors:</th>
<th>Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.</th>
</tr>
</thead>
</table>

### Credit Hours:
4

#### Developmental:
N

#### 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:
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
<table>
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<tr>
<th>Outcomes:</th>
<th>Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</th>
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</table>

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
<table>
<thead>
<tr>
<th>Instructional Resources:</th>
<th>Required:</th>
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</thead>
<tbody>
<tr>
<td>List library (e.g. books, journals, online resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</td>
<td>Engineering Lab</td>
</tr>
<tr>
<td></td>
<td>Robot Kits</td>
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<td></td>
<td>Software</td>
</tr>
<tr>
<td>Desired:</td>
<td></td>
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</tbody>
</table>

| Textbook(s) | Check with program coordinator for list of approved texts. |