## Undergraduate Degree Program
### Program - CEC Mechanical Engineering SLO (BS)

### Mission Statement
The curriculum is designed to give students a thorough understanding of the basic laws of science and simultaneously to stimulate and develop creative thinking, a professional attitude, economic judgment, and environmental consciousness.

### Mechanical and Materials Engineering

## Outcomes
FIU graduates should be able to achieve the following:

### Content Knowledge and Skills (including Technology)

<table>
<thead>
<tr>
<th>Identification of Complex Problems</th>
<th>Direct Measures</th>
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</table>
| Graduates will be able to identify complex engineering problems. | **Assessment Instrument:** Rubric  
**Assessment Method:** Industrial Advisory Board members and faculty will use a 4-point rubric to assess students' mid-project Senior Design Presentations. The presentation follows the structure of the thesis in slideshow form.  
**Course Assessed:** EML 4551  
**Sampling:** All students  
**Minimum Criteria for Success:** Students will score at "Meets Expectations (3; 75%)" or above. |

### Critical Thinking

<table>
<thead>
<tr>
<th>Formulating &amp; Solving Complex Problems</th>
<th>Direct Measures</th>
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</table>
| Graduates will be able to formulate complex engineering problems, develop a solution that meets specific needs, and successfully solve the problem. | **Assessment Instrument:** Rubric  
**Assessment Method:** 1. Industrial Advisory Board members and faculty will evaluate mid-project Senior Design presentations (EML 4551) using a 4-point rubric that assesses students' ability to:  
- Formulate Complex Engineering Problems  
2. Students' final Senior Design reports (EML 4905) will be evaluated by faculty using a 4-point scale rubric that assesses students' ability to:  
- Solve complex engineering problems  
3. Students' final Senior Design presentations (EML 4905) will be evaluated by Industrial Advisory Board members and faculty using a 4-point scale rubric that assesses students' ability to:  
- Develop solutions that meets specified needs  
**Course Assessed:** EML 4551/EML 4905  
**Sampling:** All students  
**Minimum Criteria for Success:** Students will score at "Meets Expectations (3; 75%)" or above for each of the three indicators:  
1. Formulate Complex Engineering Problems  
2. Solve complex engineering problems  
3. Develop solutions that meets specified needs |

### Recognition of Professional & Ethical Responsibilities

<table>
<thead>
<tr>
<th>Graduates will be able to recognize professional and ethical responsibilities.</th>
<th>Procedure:</th>
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</table>
| **Assessment Instrument:** Rubric  
**Assessment Method:** Industrial Advisory Board members and faculty will use a 4-point rubric to assess students' mid-project Senior Design Presentations. The presentation follows the structure of the thesis in slideshow form.  
**Course Assessed:** EML 4551 |
<table>
<thead>
<tr>
<th>Informed Judgments</th>
<th>Procedure:</th>
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</table>
| Graduates will be able to make informed judgments considering the impact of solutions in global, economic, environmental and societal contexts. | Assessment Instrument: Rubric  
Assessment Method: Industrial Advisory Board members and faculty will evaluate students’ final Senior Design presentations using a 4-point scale rubric. The showcase presentations follow the format of the full thesis document.  
Course Assessed: EML 4905  
Sampling: All students  
Minimum Criteria for Success: Students will score at "Meets Expectations (3; 75%)" or above. |
| Team Leadership | Procedure: |
| Graduates will be able to provide team leadership, create a collaborative environment, and establish goals and plan tasks to meet team objectives. | Assessment Instrument: Rubric  
Assessment Method: Industrial Advisory Board members and faculty will evaluate students' mid-project Senior design presentations using a 4-point scale rubric that assesses the following indicators:  
1. Providing team leadership & creating a collaborative environment  
2. Establishing team goals, task planning, and meeting team objectives  
Course Assessed: EML 4551  
Sampling: All students  
Minimum Criteria for Success: Students will score at "Meets Expectations (3; 75%)" or above on each of the two indicators. |
| Experimentation | Procedure: |
| Graduates will be able to develop and execute appropriate experimentation. | Assessment Instrument: Rubric  
Assessment Method: Industrial Advisory Board members and faculty will evaluate a) students' mid-project Senior Design presentations (EML 4551) and b) students' final Senior Design presentations (EML 4905) using a 4-point rubric that assesses the following indicators:  
1. Development of appropriate experimentation (EML 4551)  
2. Execution of appropriate experimentation (EML 4905)  
Course Assessed: EML 4551/EML 4905  
Sampling: All students  
Minimum Criteria for Success: Students will score at "Meets Expectations (3; 75%)" or above on each of the two indicators. |
| Analysis & Interpretation of Engineering Data | Procedure: |
| Graduates will be able to analyze and interpret engineering data and use engineering judgment to draw conclusions. | Assessment Instrument: Rubric  
Assessment Method: Industrial Advisory Board members and faculty will evaluate students’ final Senior Design report and presentation using a 4-point rubric that assesses the following indicators:  
1. Analysis of engineering data (presentation)  
2. Interpretation of engineering data (report)  
3. Use of engineering judgment to draw conclusions (presentation)  
Course Assessed: EML 4905  
Sampling: All students  
Minimum Criteria for Success: Students will score at "Meets Expectations (3; 75%)" or above on each of the three indicators. |
### Acquisition & Application of New Knowledge

Graduates will be able to acquire and apply new knowledge through the use of appropriate learning strategies.

**Procedure:**

**Assessment Instrument:** Rubric

**Assessment Method:** 1. Industrial Advisory Board members and faculty will evaluate mid-project Senior Design presentations (EML 4551) using a 4-point rubric that assesses students' ability to:
   - Acquire new knowledge through appropriate learning strategies
2. Students' final Senior Design reports (EML 4905) will be evaluated by faculty using a 4-point scale rubric that assesses students' ability to:
   - Apply new knowledge through appropriate learning strategies

**Course Assessed:** EML 4551/EML 4905

**Sampling:** All students

**Minimum Criteria for Success:** Students will score at "Meets Expectations (3; 75%)" or above on each of the two indicators.

### Communication (Oral or Written)

**Content Development, Grammar, & Visual Aids**

Graduates will be able to write using appropriate content development, grammar, and use of graphics/images that reflect professional standard within the discipline.

**Procedure:**

**Assessment Instrument:** Rubric

**Assessment Method:** Students' final Senior Design reports will be evaluated using a 4-point rubric that assesses the following written communication indicators:
1. Content Development
2. Grammar
3. Use of Visual Aids

**Course Assessed:** EML 4905

**Sampling:** All students

**Minimum Criteria for Success:** Students will score at "Meets Expectations (3; 75%)" or above for each of the three indicators.

### Oral Delivery and Visual Aids

Graduates will be able to conduct oral presentations with appropriate delivery and use of visual aids.

**Procedure:**

**Assessment Instrument:** Rubric

**Assessment Method:** Industrial Advisory Board members and faculty will evaluate students' final Senior Design presentations using a 4-point scale rubric. The showcase presentations follow the format of the full thesis document.

**Course Assessed:** EML 4905

**Sampling:** All students

**Minimum Criteria for Success:** Students will score at "Meets Expectations (3; 75%)" or above.