Course: CENG2030  
Course ID: 013395  
Eff Date: 2022-07-01  
Crse Status: Active  
Apprv. Status: Approved  

Fundamentals of Embedded Systems  
基礎嵌入式系統

This course provides foundations on essential elements in design and development of embedded systems. Topics include 3D engineering drawings, lab instrumentation, electronic circuit analysis, digital signal processing, microcontroller interfacing, sensors, and actuators. Students can gain hands-on experience from laboratory works and projects.

Grade Descriptor:

A

EXCELLENT - exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

B

GOOD - good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

C

FAIR - adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

D

MARGINAL - performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and
the ability to solve simple problems.

有关等級說明的資料，請參閱英文版本。

F

FAILURE - performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有关等級說明的資料，請參閱英文版本。

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes:

<table>
<thead>
<tr>
<th>Topics:</th>
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<tbody>
<tr>
<td>COURSE OUTCOMES</td>
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<table>
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<tr>
<th>Learning Outcomes:</th>
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<tbody>
<tr>
<td>At the end of the course of studies, students will have acquired the ability to</td>
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<tr>
<td>1. Draw 3D engineering drawings using SolidWorks</td>
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<td>2. Solve and analyze electronic circuits</td>
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<td>3. Understand the basic principles of digital signal processing</td>
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<td>4. Develop basic microcontroller-based embedded systems</td>
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<tr>
<th>Course Syllabus:</th>
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<tbody>
<tr>
<td>Week 1: 3D Drawing Using SolidWorks</td>
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<td>Week 2: 3D Parts Assembling Using SolidWorks</td>
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Week 3: Lab Instrumentation

Week 4: Circuit Analysis

Week 5: Op-amp Circuits

Week 6: Digital Signal Processing I – Frequency Analysis

Week 7: Digital Signal Processing II – Sampling, ADC & DAC

Week 8: Project 1 Week 1

Week 9: Project 1 Week 2

Week 10: Microcontroller Interfacing

Week 11: Sensors and Actuators

Week 12: Project 2 Week 1

Week 13: Project 2 Week 2

Assessment Type:

- Homework or assignment: 10%
- Lab reports: 60%
- Short answer test or exam: 30%
Feedback for Evaluation:

1. Quiz and examinations
2. Course evaluation and questionnaire
3. Question-and-answer sessions during class
4. Student consultation during office hours or online

Required Readings:

- 

Recommended Readings:


OFFERINGS

1. CENG2030
   - Acad Organization=CSD; Acad Career=UG

COMPONENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Size</th>
<th>Final Exam</th>
<th>Contact</th>
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<tbody>
<tr>
<td>LAB</td>
<td>30</td>
<td>N</td>
<td>3</td>
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<tr>
<td>LEC</td>
<td>30</td>
<td>Y</td>
<td>1</td>
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ENROLMENT REQUIREMENTS

1. CENG2030
   - Enrollment Requirement Group:
     - Pre-requisite: ENGG1110
   - New Enrollment Requirement(s):
     - Pre-requisite = no change

CAF

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<thead>
<tr>
<th>Component</th>
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<tbody>
<tr>
<td>eLearning hrs for blended cls</td>
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<tr>
<td>No. of micro-modules</td>
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<tr>
<td>Research components (UG)</td>
<td>0%</td>
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