

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Engineering

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

本科為嵌入式系統的設計和開發中的基本要素提供基礎。主題包括3D工程圖繪製，實驗室儀器，電子電路分析，數字信號處理，微控制器界面，傳感器和執行器。學生可以從實驗室工作和項目中獲得實踐經驗。

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.

有關等級說明的資料，請參閱英文版本。

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.

有關等級說明的資料，請參閱英文版本。

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.

有關等級說明的資料，請參閱英文版本。

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.

有關等級說明的資料，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.

有關等級說明的資料，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:

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to

1. Draw 3D engineering drawings using SolidWorks
2. Solve and analyze electronic circuits
3. Understand the basic principles of digital signal processing
4. Develop basic microcontroller-based embedded systems

Course Syllabus:

Week 1: 3D Drawing Using SolidWorks

Week 2: 3D Parts Assembling Using SolidWorks

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:

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Recommended Readings:

1. James W. Nilsson, Susan A. Riedel, "Electric Circuits", Upper Saddle River, N.J. : Prentice Hall
2. McClellan, James H., "Signal Processing First", Upper Saddle River, N.J. : Prentice Hall
3. Evans, Brian, "Beginning Arduino Programming", Berkeley, CA : Apress

OFFERINGS

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

COMPONENTS

LAB : Size=30; Final Exam=N; Contact=3
LEC : Size=30; Final Exam=Y; Contact=1

ENROLMENT REQUIREMENTS

1. CENG2030 **Enrollment Requirement Group:**
 Pre-requisite: ENGG1110

New Enrollment Requirement(s):
Pre-requisite = no change

CAF

eLearning hrs for blended cls 0
No. of micro-modules 0
Research components (UG) 0%

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