

Academic Org: Div of Computer Science & Engg – Subject: Computer Engineering

**Course:** CENG5050      **Course ID:** 010569      **Eff Date:** 2022-07-01      **Crse Status:** Active      **Apprv. Status:** Approved      **【Course Rev】**  
Hardware for Human Machine Interface 人機界面硬件

This course teaches topics in designing hardware for human machine interface. Principles and applications of sensors like pressure, light, sound, motion and electromagnetic transducers are introduced. Computer interfacing techniques for signal sampling, amplification, filtering, classification and interpretation are also discussed. Design examples may include Electroencephalography (EEG) signal analysis, human motion capturing, music signal interpretation and production. Functioning and control of actuators will also be studied.  
Advisory: Students are expected to have taken CENG2400 or ESTR2100 or equivalent.

本科教導人機界面硬件計設，包括壓力、光、聲、運動和電磁傳感器的運作和應用等。本科討論計算機接口技術，如傳感器信號採樣、信號放大、濾波、數據分類和解釋等問題。設計的例子可能包括腦電圖（EEG）信號分析、人體運動捕獲、音樂信號的解釋和產生等。本科也包括驅動器運作及控制技術。  
建議：學生應曾修讀CENG2400或 ESTR2100或同等學歷。

**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:** MSc Computer Science  
MPhil-PhD Computer Sci & Erg

**Topics:**

**COURSE OUTCOMES**

**Learning Outcomes:**

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

1. select suitable sensors for a human machine interface system,
2. build a reliable signal capturing system,
3. understand the basic capture and signal processing algorithms for human machine interface signals.

**Course Syllabus:**

This course teaches topics in designing hardware for human machine interface. Principles and applications of sensors like pressure, light, sound, motion and electromagnetic transducers are introduced. Computer interfacing techniques for signal sampling, amplification, filtering, classification and interpretation are also discussed. Design examples may include Electroencephalography (EEG) signal analysis, human motion capturing, music signal interpretation and production. Functioning and control of actuators will also be studied.

**Assessment Type:**

Lab reports	: 50%
Selected response test or exam	: 50%

**Feedback for Evaluation:**

1. Mid-term course and teaching evaluation
2. Final course and teaching evaluation

**Required Readings:**

To be provided by course teacher.

**Recommended Readings:**

1. A.C. Fischer-Cripps, Newnes Interfacing Companion: Computers, Transducers, Instrumentation and Signal Processing, .Newnes, Great Britain, 2002
2. Andrea De Marcellis , Giuseppe Ferri, Analog Circuits and Systems for Voltage-Mode and Current-Mode Sensor Interfacing Applications (Analog Circuits and Signal Processing), Springer Dordrecht Heidelberg, London New York, 2011

**OFFERINGS**

1. CENG5050	Acad Organization=CSEGV; Acad Career=RPG
-------------	--

**COMPONENTS**

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

**ENROLMENT REQUIREMENTS**

1. CENG5050	Enrollment Requirement Group:
-------------	-------------------------------

For students in MSc Computer Science; or  
For students in MPhil-PhD Computer Science & Engineering; or  
For students in UG Computer Science; or  
For students in UG Computer Engineering

**CAF**

---

---

**<END OF REPORT>**