Course Title	MICROPROCESSOR PROGRAMMING	Instructor	HSIEN-WEI TSENG
Course Class	TETXE3A DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, 3A	Details	◆ General Course ◆ Required ◆ One Semester ◆ 2 Credits
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Educate students to have knowledge in mathematics, science and engineering to solve electrical engineering related problems.

Ⅱ. Educate the student as a team work electrical engineer to be independently complete the assigned tasks.

Ⅲ. Educate students to realize the trend variations of electrical engineering industry and copy with the challenges of modern diversified professor careers.

Subject Departmental core competences

A. Have the ability to apply mathematical tools along with scientific methods to solve electrical engineering related problems.(ratio:15.00)

B. Have the ability to design and execute electrical engineering experiments, analyze and interpret data.(ratio:5.00)

C. Have the necessary knowledge, skills and the ability to operate modern tools to execute the practical electrical engineering issues.(ratio:15.00)

D. Have the ability to design electrical engineering systems, components, or manufacturing processes.(ratio:5.00)

E. Have the abilities to manage electrical engineering projects, to skillfully communicate, to integrate various fields and cooperate team members.(ratio:30.00)

F. Have the ability to discover, analyze, apply research results and cope with the issues resulting from the integration of electrical engineering complex problems.(ratio:5.00)

G. Have the ability to realize the world affairs, to understand how engineering technology effects on the environment, society and the globe and to acknowledge the lifelong learning.(ratio:15.00)

H. Have the ability to understand and apply professional ethics, and have correct awareness on the social responsibility and the intellectual property, and respect diversified perspectives.(ratio:10.00)

	Subject Schoolwide essential virtues	
	1. A global perspective. (ratio:5.00)	
	2. Information literacy. (ratio:20.00)	
	3. A vision for the future. (ratio:15.00)	
	4. Moral integrity. (ratio:10.00)	
	5. Independent thinking. (ratio:10.00)	
	6. A cheerful attitude and healthy lifestyle. (ratio:15.00)	
	7. A spirit of teamwork and dedication. (ratio:15.00)	
	8. A sense of aesthetic appreciation. (ratio:10.00)	

Course Introduction	This course introduces microprocessor programming and Internet of Things (IoT) applications, with hands-on practice using Python and simulation platforms. Students will employ tools such as Wokwi to build virtual devices, and integrate MQTT, ThingSpeak, or Node-RED for data transmission and visualization, experiencing the IoT development process. The course emphasizes the integration of data collection, programming, and cloud applications.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

 I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of
        the course's veracity, conception, procedures, outcomes, etc.
II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal,
        morals, attitude, conviction, values, etc.
III.Psychomotor: Emphasis upon the study of the course's physical activity and technical
        manipulation.

No.	Teaching Objectives	objective methods
1	1.Understand the fundamental concepts and applications of microprocessor programming. 2.Learn to develop microprocessor programs using Python. 3.Acquire skills in building and testing devices through simulation platforms. 4.Gain knowledge of data transmission and cloud-based visualization, and integrate them into IoT applications.	Cognitive

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEFGH	12345678	Lecture, Practicum, Imitation	Discussion(including classroom and online), Practicum, Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	114/09/15～114/09/21	課程導論與微處理機概觀	
2	114/09/22～114/09/28	Python 基礎程式設計 (I)	
3	114/09/29～114/10/05	Python 基礎程式設計 (II)	
4	114/10/06～114/10/12	模擬平台操作入門	
5	114/10/13～114/10/19	建立與測試虛擬裝置 (I)	
6	114/10/20～114/10/26	建立與測試虛擬裝置 (II)	
7	114/10/27～114/11/02	專題報告準備與實作討論(期中)	
8	114/11/03～114/11/09	期中考/期中評量週(老師得自行調整週次)	
9	114/11/10～114/11/16	期中多元評量週	
10	114/11/17～114/11/23	MQTT 通訊協定與實作	
11	114/11/24～114/11/30	ThingSpeak 雲端資料上傳與展示	
12	114/12/01～114/12/07	Node-RED 資料視覺化	
13	114/12/08～114/12/14	IoT 系統流程整合 (I)	
14	114/12/15～114/12/21	IoT 系統流程整合 (II)	
15	114/12/22～114/12/28	專題報告準備與實作討論(期末)	
16	114/12/29～115/01/04	期末多元評量週	
17	115/01/05～115/01/11	期末多元評量週/教師彈性教學週	
18	115/01/12～115/01/18	教師彈性教學週	

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

Key capabilities	self-directed learning Information Technology Problem solving Interdisciplinary
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	Special/Problem-Based(PBL) Courses
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Logical Thinking
Requirement	生成式 AI 倫理聲明 本課程依據透明和負責任的原則，鼓勵學生利用 AI 進行協作和互學，以提升課程成果。 本課程採取以下措施： 有條件開放，請註明學生如何使用生成式 AI 於課程成果中。 學生應在課堂作業或報告中的「標題頁註腳」或「引用文獻後」簡要說明他們如何使用生成式 AI（，例如進行議題發想、文潤飾或或結參見考等。如果經查核發現使用生成式 AI 但未在作業或 報告中標明，教師、學校或相關單位有權重新評分或不予計分。 此外，本課程的授課教材或學習資料如有引用生成式 AI 內容，教師也會在投影片或口頭標註。修 讀本課程的學生在選課時視為同意以上倫理聲明。
Textbooks and Teaching Materials	Self-made teaching materials:Presentations, Handouts
References	
Grading Policy	◆ Attendance： 20.0 ％ ◆ Mark of Usual：20.0 ％ ◆ Midterm Exam： 30.0 ％ ◆ Final Exam： 30.0 ％ ◆ Other〈 〉： ％
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at https://web2.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php. ※"Adhere to the concept of intellectual property rights" and "Do not illegally photocopy, download, or distribute." Using original textbooks is advised. It is a crime to improperly photocopy others' publications.