

## Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	INTEGRATED TECHNOLOGY OF INFORMATION AND MECHATRONICS	Instructor	LI, I-HSUM
Course Class	TEBXM1A MASTER'S PROGRAM, DEPARTMENT OF MECHANICAL AND ELECTRO-MECHANICAL ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education		
D e p a r t m e n t a l   A i m   o f   E d u c a t i o n			
I . To prepare students who have a comprehensive understanding of the principles of applied sciences and engineering to be innovators in the field of mechanical and electromechanical engineering. II. To train emerging professionals who possess a high level of expertise and ethical standards who will become independent research and development leaders in the industry. III. To motivate students who will pursue continuing education as a means to stay on the cutting edge of global competitiveness and meet changes in their careers and the workplace with confidence and ease.			
Subject Departmental core competences			
A. Head: Knowledge of mechanical and electromechanical engineering.(ratio:30.00) B. Hand: Hands-on skills and practical realization.(ratio:40.00) C. Heart: Love of learning and innovation.(ratio:20.00) D. Eye: Vision of progress and improvements.(ratio:10.00)			
Subject Schoolwide essential virtues			
1. A global perspective. (ratio:20.00) 2. Information literacy. (ratio:30.00) 3. A vision for the future. (ratio:5.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:25.00) 6. A cheerful attitude and healthy lifestyle. (ratio:5.00) 7. A spirit of teamwork and dedication. (ratio:5.00) 8. A sense of aesthetic appreciation. (ratio:5.00)			

Course Introduction	<p>This course aims to train qualified students to meet the needs of the intelligent manufacturing system (IMS). The course contains two parts: An information system for a manufacturing system and an AI information analysis system. This course also includes the data acquisition technique and communication technique, which tell you how to collect and dispatch data. You have to do a project about the IMS and make a discussion for the project. This course will organize one or two keynote speeches about the advanced IMS.</p>
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**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	This course uses Problem Based Learning. The objective of this course will give students to have the background knowledge and analytical tools they need for the integrated technology of information and mechatronics and its applications.	Psychomotor
2	The primary goal of this course is to "cultivate integrated talents in smart manufacturing." The planned curriculum focuses on learning smart manufacturing information systems and deep learning data analysis, aiming to connect concepts of networking communication and manufacturing information collection.	Cognitive

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

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

2	ABCD	12345678	Lecture, Discussion, Practicum	Discussion(including classroom and online), Practicum, Report(including oral and written)
Course Schedule				
Week	Date	Course Contents		Note
1	113/02/19 ~ 113/02/25	資機電技術簡介說明 (introduction to integrated technology of information and mechatronics and its applications)		
2	113/02/26 ~ 113/03/03	感測器資料擷取技術 (Sensor Data Extraction using Arduino UNO)		
3	113/03/04 ~ 113/03/10	實作感測器資料擷取技術 (Implement of sensor Data Extraction)		
4	113/03/11 ~ 113/03/17	實作感測器資料擷取技術 (Implement of sensor Data Extraction)		
5	113/03/18 ~ 113/03/24	資機電技術專案製作提案 ( Proposal Discussion) 台達電參訪 ( 暫訂 )		
6	113/03/25 ~ 113/03/31	樹莓派實作、安裝練習 (Raspberry Pi 4 installation and test)		
7	113/04/01 ~ 113/04/07	Python 實作練習 (Python Practice using Raspberry Pi 4)		
8	113/04/08 ~ 113/04/14	序列埠通訊實作 ( implementation of RS232 communication)		
9	113/04/15 ~ 113/04/21	期中評量 (Mid-term evaluation)		
10	113/04/22 ~ 113/04/28	資料庫概念與實作 (Database implementation, MongoDB)		
11	113/04/29 ~ 113/05/05	資料庫概念與實作 (Database implementation, MongoDB)		
12	113/05/06 ~ 113/05/12	資機電整合練習 ( Practice of technology of information and mechatronics and its applications)		
13	113/05/13 ~ 113/05/19	問題討論 (Discussion)		
14	113/05/20 ~ 113/05/26	深度學習簡介 ( Introduction of Deep Learning)		
15	113/05/27 ~ 113/06/02	LSTM 時間序列預測 ( LSTM Prediction Technology )		
16	113/06/03 ~ 113/06/09	LSTM 時間序列預測 ( LSTM Prediction Technology )		
17	113/06/10 ~ 113/06/16	期末評量 (Final evaluation)		

18	113/06/17 ~ 113/06/23	Case Study using Videos (online)	
Key capabilities	Information Technology		
Interdisciplinary			
Distinctive teaching			
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) AI application		
Requirement	課程以機器人控制實作及應用為主。具備程式撰寫能力較佳，如python,c語言。 This course uses Python and C a lot.		
Textbooks and Teaching Materials	Self-made teaching materials:Presentations		
References			
Grading Policy	◆ Attendance : 10.0 %    ◆ Mark of Usual :       %    ◆ Midterm Exam : 20.0 % ◆ Final Exam : 20.0 % ◆ Other 〈實作〉 : 50.0 %		
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a> . <b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b>		