

Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	TECHNOLOGIES AND APPLICATIONS OF 5G/B5G AND NEXT-GENERATION COMMUNICATIONS(6G)	Instructor	LIAO, SHU-HAN
Course Class	TETJM1A MASTER'S PROGRAM IN ARTIFICIAL INTELLIGENCE ROBOTICS, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Educate students to have electrical and robotic engineering knowledge to solve electrical engineering related problems. II. Educate the student as a senior electrical and robotic engineer to enable creative thinking, to be independently complete the assigned tasks and be willing to work as a team member. III. Educate students to have advanced global awareness to cope with the challenges of modern diversified professor careers. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Core competency 1.1: Have professional knowledge in the disciplines of electrical, computer and robotic engineerings.(ratio:30.00) B. Core competency 1.2: Have the ability to plan and execute electrical and robotic engineering research studies.(ratio:20.00) C. Core competency 2.1: Have the ability to prepare professional papers in the electrical and robotic engineering field.(ratio:10.00) D. Core competency 2.2: Have the abilities to be creative thinking and to independently solve electrical and robotic engineering related problems.(ratio:20.00) E. Core competency 2.3: Have the ability to lead, manage, plan, coordinate and integrate personnel from various fields.(ratio:10.00) F. Core competency 3.1: Have advanced global awareness and the ability of lifelong self-study.(ratio:10.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 1. A global perspective. (ratio:20.00) 2. Information literacy. (ratio:30.00) 3. A vision for the future. (ratio:20.00) 			

4. Moral integrity. (ratio:5.00)
5. Independent thinking. (ratio:10.00)
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	The current course introduces the basic concept of 5G technologies, including 5G Technology Drivers, 5G Architecture, Standardization, Mobile Network and Core Network operations, as well as 5G Air Interface and Multi-Access Edge Computing (MEC) in 5G.
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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	The concept of machine learning and its applications	Cognitive

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

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

Course Schedule

Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	Introduction to 5G Wireless Communications	

2	114/02/24 ~ 114/03/02	5G Requirements and Specifications	
3	114/03/03 ~ 114/03/09	5G Standardization	
4	114/03/10 ~ 114/03/16	5G Mobile Networks and Core	
5	114/03/17 ~ 114/03/23	5G Air Interface	
6	114/03/24 ~ 114/03/30	5G as an Innovation Platform	
7	114/03/31 ~ 114/04/06	Security for 5G Wireless Communications	
8	114/04/07 ~ 114/04/13	5G Operational Scenarios	
9	114/04/14 ~ 114/04/20	5G and Beyond – Looking 5 over Years Ahead	
10	114/04/21 ~ 114/04/27	Midterm Exam Week	
11	114/04/28 ~ 114/05/04	Vision towards 6G	
12	114/05/05 ~ 114/05/11	The Perfect storm: Role of AI, Blockchain, Cloud and Quantum Computing in Cellular Networks	
13	114/05/12 ~ 114/05/18	Open RAN and Core – Architecture and Implications to Existing 5G Architecture	
14	114/05/19 ~ 114/05/25	Introduction to Intent-driven Networking	
15	114/05/26 ~ 114/06/01	Introduction to Autonomous Networks (Self-X)	
16	114/06/02 ~ 114/06/08	NEXT-GENERATION COMMUNICATIONS(6G)	
17	114/06/09 ~ 114/06/15	NEXT-GENERATION COMMUNICATIONS(6G)	
18	114/06/16 ~ 114/06/22	Final Exam Week	
Key capabilities			
Interdisciplinary			
Distinctive teaching			

Course Content	AI application
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations Using teaching materials from other writers:Presentations
Grading Policy	<p>◆ Attendance : 10.0 % ◆ Mark of Usual : 10.0 % ◆ Midterm Exam : %</p> <p>◆ Final Exam : 80.0 %</p> <p>◆ Other < > : %</p>
Note	<p>This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.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.</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>