

Tamkang University Academic Year 113, 1st Semester Course Syllabus

Course Title	DISCRETE MATHEMATICS	Instructor	JEONG JAESIK
Course Class	TKFXB1B DEPARTMENT OF ARTIFICIAL INTELLIGENCE, 1B	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Required ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Students may analyze problems in applied science based on the fundamental knowledge of programming, mathematics, and artificial intelligence. II. Students may plan and implement an AI system following the procedures of problem analysis, experiment testing, data visualizing, derivation and deduction. III. Educate the students to be AI engineers who may accomplish their missions independently and may collaborate with their colleagues in the workplace. IV. Students may have basic skills and global competence for career diversification, and may keep lifelong learning. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Professional analysis.(ratio:65.00) B. Practical application.(ratio:20.00) C. Professional attitude.(ratio:10.00) D. Global Mobility.(ratio:5.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 1. A global perspective. (ratio:5.00) 2. Information literacy. (ratio:30.00) 3. A vision for the future. (ratio:10.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:30.00) 6. A cheerful attitude and healthy lifestyle. (ratio:5.00) 7. A spirit of teamwork and dedication. (ratio:10.00) 8. A sense of aesthetic appreciation. (ratio:5.00) 			

Course Introduction	<p>This course provides a comprehensive overview of discrete structures and their applications, essential for artificial intelligence and related fields. We will explore logic, set theory, counting methods, graph theory, and others. The course emphasizes developing logical thinking, problem-solving, and analytical skills. Students will be equipped to understand and manipulate discrete systems.</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	1. Understand Fundamental Concepts 2. Develop Logical Thinking 3. Apply concepts to solve practical problems	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, Experience	Testing, Study Assignments, Discussion(including classroom and online), Practicum

Course Schedule

Week	Date	Course Contents	Note
1	113/09/09 ~ 113/09/15	Introduction to Discrete Mathematics	
2	113/09/16 ~ 113/09/22	The Foundations: Logic and Proofs	
3	113/09/23 ~ 113/09/29	Basic Structures: Set, Functions	
4	113/09/30 ~ 113/10/06	Basic Structures: Sequences, Matrices	

5	113/10/07 ~ 113/10/13	Number Theory and Cryptography	
6	113/10/14 ~ 113/10/20	Number Theory and Cryptography	
7	113/10/21 ~ 113/10/27	Induction and Recursion	
8	113/10/28 ~ 113/11/03	Induction and Recursion & Review	
9	113/11/04 ~ 113/11/10	Midterm Exam/Midterm Assessment Week (teachers can adjust the week as needed)	
10	113/11/11 ~ 113/11/17	Counting Methods	
11	113/11/18 ~ 113/11/24	Counting Methods	
12	113/11/25 ~ 113/12/01	Relations	
13	113/12/02 ~ 113/12/08	Relations	
14	113/12/09 ~ 113/12/15	Graphs	
15	113/12/16 ~ 113/12/22	Graphs	
16	113/12/23 ~ 113/12/29	Trees	
17	113/12/30 ~ 114/01/05	Final Exam/Final Assessment Week (teachers can adjust the week as needed)	
18	114/01/06 ~ 114/01/12	Flexible Teaching Week: Generally, no in-person classes; teachers may arrange teaching activities or final assessments, among other options.	
Key capabilities		self-directed learning Problem solving	
Interdisciplinary		STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)	
Distinctive teaching			
Course Content		Logical Thinking	

Requirement	
Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Discrete Mathematics and Its Applications, Eighth Edition, Kenneth H. Rosen
References	
Grading Policy	<p>◆ Attendance : 10.0 % ◆ Mark of Usual : 20.0 % ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 40.0 %</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>