Tamkang University Academic Year 113, 1st Semester Course Syllabus

Course Title	TRANSPORTATION NETWORK ANALYSIS	Instructor	CHEN, CHUN-YING
Course Class	TLTXM1A MASTER'S PROGRAM, DEPARTMENT OF TRANSPORTATION MANAGEMENT, 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 2 Credits
Relevance to SDGs	SDG9 Industry, Innovation, and Infrastructure SDG16 Peace, justice and strong institutions		

Departmental Aim of Education

Ⅰ. To understand basic transportation theories.

Ⅱ. To familiarize with practical procedures of solving problems.

Ⅲ. To enhance language expression and interpersonal communication.

Ⅳ. To expand ability of system analysis and interdisciplinary integration.

Ⅴ. To develop transportation ethics and humanistic quality.

Subject Departmental core competences

A. To obtain basic ability of research on transportation theories.(ratio:25.00)

B. To obtain ability to practically solve problems.(ratio:25.00)

C. To obtain ability of language expression and interpersonal communication.(ratio:15.00)

D. To obtain ability of transportation system analysis and interdisciplinary integration. (ratio:25.00)

E. To develop transportation ethics, humanistic quality, and innovative thinking.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:25.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:5.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	The content of this course is mainly to introduce the theory and application of network analysis in transportation so that students have a basic theoretical foundation. To enable students to have the ability of model construction methods, practical applications, and solving methods for commonly used transportation networks.

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	Make students have an understanding of the related solutions of operations research.	Cognitive

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

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

Course Schedule

Week	Date	Course Contents	Note
1	113/09/09 ~ 113/09/15	Course outline and introduction	
2	113/09/16 ~ 113/09/22	Paths, Trees and Cycles	
3	113/09/23 ~ 113/09/29	Maximum Flows Problem & Minimum Spanning Trees	
4	113/09/30 ~ 113/10/06	Maximum Flows Problem & Minimum Spanning Trees	

5	113/10/07 ~ 113/10/13	Transportation Problem & Assignment Problem	
6	113/10/14 ~ 113/10/20	Transportation Problem & Assignment Problem	
7	113/10/21 ~ 113/10/27	Transportation Problem & Assignment Problem	
8	113/10/28 ~ 113/11/03	Shortest Path Problem-Label Setting Algorithm	
9	113/11/04 ~ 113/11/10	Shortest Path Problem-Label Setting Algorithm	
10	113/11/11 ~ 113/11/17	Midterm exam	
11	113/11/18 ~ 113/11/24	Chinese Postman Problem & Traveling Salesman Problem	
12	113/11/25 ~ 113/12/01	Midterm report presentation (computer programming)	
13	113/12/02 ~ 113/12/08	Vehicle routing problem	
14	113/12/09 ~ 113/12/15	Heuristic algorithm	
15	113/12/16 ~ 113/12/22	Related application	
16	113/12/23 ~ 113/12/29	Related application	
17	113/12/30 ~ 114/01/05	Term project presentation	
18	114/01/06 ~ 114/01/12	(Supplementary Teaching)	

Key capabilities	self-directed learning Problem solving
Interdisciplinary	
Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) AI application
Requirement	Bring a laptop if you have one. For the detailed grading policy, please see the classroom slides.

Textbooks and Teaching Materials	Self-made teaching materials:Presentations Name of teaching materials: You can download from Iclass
References	Ravindra Ahuja, Thomas Magnanti, James Orlin, Network Flows Theory, Algorithms and Applications. Frederick Hillier, Gerald Lieberman, Introduction to Operations Research
Grading Policy	◆ Attendance： %　◆ Mark of Usual：25.0 %　◆ Midterm Exam： 20.0 % ◆ Final Exam： 25.0 % ◆ Other〈Homework〉：30.0 %
Note	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 . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**