

Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	DATA ANALYSIS	Instructor	WANG, SHENG-WEI
Course Class	TEWXM1A MASTER'S PROGRAM, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	<ul style="list-style-type: none"> ◆ Blended Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Cultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering. II. Cultivating students with capability of solving problems through researching, planning, and management. III. Cultivating students to become professional engineers with care in environment and professional ethics. IV. Preparing students with the capabilities of engaging in international engineering business, to adapt to globalization and social needs, and to expand their global perspectives. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:20.00) B. Capabilities of planning and conducting experiments, analyzing and explaining experimental data, applying information tool, and collecting and compiling data. (ratio:30.00) C. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:25.00) D. Skill of using professional foreign language and global perspective.(ratio:5.00) E. Capabilities of writing and presenting research report.(ratio:10.00) F. Awareness of the importance of teamwork, working attitude and professional ethics, and to learn continuously.(ratio:10.00) 			
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:5.00) 			

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:15.00)
8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction

This course mainly introduces numerical data analysis methods, using SPSS statistical software to teach students to conduct various statistical analyses, and train students to observe data and interpret analytical results.

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 will develop the observation and interpretation of numerical data, and improve the ability of describing data in scientific reports.	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, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Note for Blended Course : When utilizing weekly digital instruction, please fill in "Online Asynchronous Instruction".

Week	Date	Course Contents	Note
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1	112/09/11 ~ 112/09/17	Introduction and Descriptive statistics	
2	112/09/18 ~ 112/09/24	Chi-Square homogeneity test	
3	112/09/25 ~ 112/10/01	Hypothesis test	
4	112/10/02 ~ 112/10/08	Regression	
5	112/10/09 ~ 112/10/15	National holiday	
6	112/10/16 ~ 112/10/22	Correlation	
7	112/10/23 ~ 112/10/29	Factor analysis and cluster analysis	Online Asynchronous Instruction
8	112/10/30 ~ 112/11/05	Discriminant analysis	Online Asynchronous Instruction
9	112/11/06 ~ 112/11/12	Midterm exam	
10	112/11/13 ~ 112/11/19	Analysis of Variance (ANOVA)	
11	112/11/20 ~ 112/11/26	Multivariate Statistical Analysis	
12	112/11/27 ~ 112/12/03	Mann-Kendall test	
13	112/12/04 ~ 112/12/10	Deseasonalization	
14	112/12/11 ~ 112/12/17	Dynamic factor analysis	
15	112/12/18 ~ 112/12/24	Data visualization	
16	112/12/25 ~ 112/12/31	Final exam	
17	113/01/01 ~ 113/01/07	National holiday	
18	113/01/08 ~ 113/01/14	Blended Learning	
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	USR curriculum		

Course Content	Logical Thinking
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations
References	
Grading Policy	<p>◆ Attendance : 10.0 % ◆ Mark of Usual : 40.0 % ◆ Midterm Exam : 20.0 %</p> <p>◆ Final Exam : 30.0 %</p> <p>◆ Other () : %</p>
Note	<p>1. This syllabus may be uploaded at the website of the Course Syllabus Management System at https://info.ais.tku.edu.tw/csp or through the link of the Course Syllabus Upload posted on the home page of the TKU Office of Academic Affairs http://www.acad.tku.edu.tw/CS/main.php</p> <p>2. According to the Implementation regulations of distance education for junior college and above are prescribed pursuant to Article 2, "The distance learning course referred to in these Measures refers to more than one-half of the teaching hours in each subject."</p> <p>3. According to the regulations of Tamkang University Enforcement Rules for digital teaching, Paragraph 2 and Article 3, the distance learning course of our school must be "The course of digital teaching with distance learning platform or synchronous video system in our school. Teaching Hours include course lectures, teacher-student interaction discussions, quizzes and other learning activities."</p> <p>4. If there are any temporary course changes (including time changes and classroom changes of distance learning courses, blended courses), please make out an application according to regulations to the Office of Academic Affairs.</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>