Tamkang University Academic Year 101, 2nd Semester
Course Syllabus

Course Title	**Pavement Design**	Instructor	**Ming-Jen Liu**

Department/Year/Class	Course Details			
Civil Engineering Dept./ Infrastructure Division/ Third-Year/ Class P	☐Required ■Selective	■**0（One Semester）** ☐**1（1st Semester）** ☐**2（2nd Semester）** ☐**3（3rd Semester）**	Credits	**3**

Aim of Education	Core Competences
1. Develop students' ability and knowledge of civil engineering to meet the requirements of employability and further education. 2. Enable students to have management knowledge and literacy to meet challenges of workplace. 3. Equip students with the information technology skills to strengthen their competitiveness. 4. Develop students' literacy of Literature, Art, Language, History, Society, Politics, Futurology, International Situation, Religious Law, Nature and such general courses to have the understanding of humanity emotions and to proceed on-going development .	A. Each student should have the professional knowledge of engineering and be able to solve related problems with the logics of mathematics and mechanics. B. Each student should have civil engineering design and analysis capabilities. C. Each student should be able to operate measuring instrument and engineering materials experiments, and be able to analyze the data. D. Each student should be able to solve engineering problems with basic information technology. E. Each student should have practical knowledge of construction, understand the importance of teamwork; and have respect for professional ethics and understand the code and responsibility of morality. F. Each student should understand the interaction of engineering and environment, social interaction, and proceed lifelong learning. G. Each student should have the training and experience of Interdisciplinary knowledge and understand the importance of integration of technology to modernization and future development of engineering. H. Each student should understand the international trends, and be capable to continually improve foreign language skills.

Course Introduction (50 to 100 words)	**This course is designed for students to understand basic pavement types and properties, pavement materials, methods of analysis, and design procedures of pavement. Pavement construction, performance evaluation, as well as pavement management systems are also introduced.**

The Relevance among Teaching Objectives, Objective Levels and Core Competences

I.Objective Levels (select applicable ones)：

(I) Cognitive Domain：C1 Remembering、C2 Understanding、C3 Applying、C4 Analyzing、C5 Evaluating、C6 Creating

(II) Psychomotor Domain：P1 Imitation、P2 Mechanism、P3 Independent Operation、P4 Linked Operation、P5 Automation、P6 Origination

(III) Affective Domain：A1 Receiving、A2 Responding、A3 Valuing、A4 Organizing、A5 Charaterizing、A6 Implementing

II.The Relevance among Teaching Objectives, Objective Levels and Core Competences：

(I)Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objectives. Each objective should correspond to the objective level(s) of ONLY ONE of the three domains.

(II)If more than one objective levels are applicable for each learning domain, select the highest one only. (For example, if the objective levels for Cognitive Domain include C3, C5, and C6, select C6 only and fill it in the boxes below. The same rule applies to Psychomotor Domain and Affective Domain.)

(III)Determine the core competences that correspond to each teaching objective. Each objective may correspond to one or more core competences at a time. (For example, if one objective corresponds to three core competences: A, AD, and BEF, list all of the three in the box.)

Teaching objectives	Relevance	
	Objective Levels	Core Competences
1. Students will be able to understand the basic knowledge of pavement types, structures, traffic loadings and environmental factors.	**C2**	**AB**
2. Students will be able to learn the properties of pavement materials, and methods of pavement analysis and design.	**P3**	**ABCD**
3. Students will be able to understand the process of pavement construction, performance evaluation and pavement management system.	**C5**	**EG**

Teaching Objectives, Teaching Methods and Assessment

Teaching Objectives	Teaching Methods	Assessment
1. Students will be able to understand the basic knowledge of pavement types, structures, traffic loadings and environmental factors.	**Lectures.**	**Assignments, quiz, examinations.**
2. Students will be able to learn the properties of pavement materials, and methods of pavement analysis and design.	**Lectures.**	**Assignments, quiz, examinations, computer project reports.**
3. Students will be able to understand the process of pavement construction, performance evaluation and pavement management system.	**Lectures.**	**Assignments, quiz, examinations.**

This course has been designed to cultivate the following essential qualities in TKU students.

Essential Qualities of TKU Students	Description
■global perspectives	**Students will learn and use major design methods for concrete and asphalt highway pavements in the global world.**
■a vision for the future	**Students will understand the future trends of design methods for concrete and asphalt highway pavements.**
■information literacy	**Students will learn and apply computer software tools for pavement stress analysis.**
□ethical and moral principles	
■independent thinking	**Students will understand factors that affect pavement performance and be able to design pavements.**
□an awareness of healthy living	
□effective teamwork	
□an appreciation of the arts	

Course Schedule

Week	Date	Subject/Topics	Note
1	**2/18**	**Historical Review and Pavement types**	
2	**2/25**	**Flexible Pavement Basics**	
3	**3/4**	**Rigid Pavement Basics**	
4	**3/11**	**Flexible Pavement Analysis（I）**	
5	**3/18**	**Flexible Pavement Analysis（II）**	
6	**3/25**	**KENLAYER Software Application**	
7	**4/1**	**Rigid Pavement Analysis（I）**	
8	**4/8**	**Rigid Pavement Analysis（II）**	
9	**4/15**	**KENSLAB Software Application**	
10		Midterm Exam Week	
11	**4/29**	**Pavement Serviceability Concept**	
12	**5/6**	**Equivalent Axle Loads Analysis**	
13	**5/13**	**Traffic Data Analysis**	
14	**5/20**	**AI Flexible Pavement Design Method**	
15	**5/27**	**AASHTO Flexible Pavement Design Method**	
16	**6/3**	**PCA Rigid Pavement Design Method**	
17	**6/10**	**AASHTO Rigid Pavement Design Method**	
18		Final Exam Week	

Requirement	
Teaching Facility	■Computer □Overhead Projector □Other（_____）
Textbook(s)	**Huang, Y. H., *Pavement Analysis and Design*, Pearson/Prentice Hall, 2nd Ed., 2004.**
Suggested Readings	**Yoder & Witczak, *Principle of Pavement Design*, John Wiley & Sons, 2nd Ed., 1975.**
Number of Assignment(s)	(Filled in only for those courses that apply)

Grading Policy	**Attendance and Quiz（10%）** **Assignments and Computer Project Report（10%）** **Mid-semester Examination（35%）** **Final Examination（45%）**
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/index.asp. **※Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**

Form No.：ATRX-Q03-001-FM201-05