Tamkang University Academic Year 110, 1st Semester Course Syllabus

Course Title	JUNIOR STRUCTURAL DYNAMICS	Instructor	CHIEH-HSUN WU
Course Class	TECXB4P DEPARTMENT OF CIVIL ENGINEERING, 4P	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Cultivate students' professional knowledge of civil engineering and attitude towards self-learning to satisfy demands for employment and advanced studies.

Ⅱ. Cultivate students' abilities of engineering project execution and practical views of coordination.

Ⅲ. Cultivate students' information technology skills for innovation implementation.

Ⅳ. Cultivate students' engineering ethics, liberal arts mind, and global perspectives.

Subject Departmental core competences

A. Civil Engineering Professional Proficiency.(ratio:60.00)

B. Implementation and Information Processing Ability.(ratio:20.00)

C. Team collaboration and Knowledge Integration Ability.(ratio:20.00)

Subject Schoolwide essential virtues

2. Information literacy. (ratio:40.00)

5. Independent thinking. (ratio:60.00)

Course Introduction	This course introduces the basics of vibration theory that is fundamental in structural dynamics. It begins with the free & forced vibrations of a single degree of freedom system (DOF). Systems of two and more DOFs are discussed later.

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	Students will be able to learn the fundamentals of structural dynamics through understanding the basics of vibration theory.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABC	25	Lecture, Discussion, Experience	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	110/09/22 ~ 110/09/28	Introduction/Oscillatory motion	
2	110/09/29 ~ 110/10/05	Free Vibration - Vibration Model, Equation of Motion	
3	110/10/06 ~ 110/10/12	Free Vibration - Vibration Model, Equation of Motion	
4	110/10/13 ~ 110/10/19	Free Vibration - Viscously Damped Free Vibration, Logarithmic Decrement, Coulomb Damping	
5	110/10/20 ~ 110/10/26	Free Vibration - Viscously Damped Free Vibration, Logarithmic Decrement, Coulomb Damping	
6	110/10/27 ~ 110/11/02	Harmonically Excited Vibr. - Forced Harmonic Vibr	
7	110/11/03 ~ 110/11/09	Harmonically Excited Vibr. - Forced Harmonic Vibr.	
8	110/11/10 ~ 110/11/16	Harmonically Excited Vibr. - Rotating Unbalance	
9	110/11/17 ~ 110/11/23	Midterm Exam Week	
10	110/11/24 ~ 110/11/30	Harmonically Excited Vibr. - Support Motion	

11	110/12/01 ~ 110/12/07	Harmonically Excited Vibr. - Support Motion	
12	110/12/08 ~ 110/12/14	2DOF System - The Normal Mode Analysis, Initial Conditions	
13	110/12/15 ~ 110/12/21	2DOF System - The Normal Mode Analysis, Initial Conditions	
14	110/12/22 ~ 110/12/28	2DOF System - The Normal Mode Analysis, Initial Conditions	
15	110/12/29 ~ 111/01/04	Properties of Vibr. Systems - Flexibility Influence Coefs., Reciprocity Theorem, Stiffness Influence Coefs	
16	111/01/05 ~ 111/01/11	Properties of Vibr. Systems - Flexibility Influence Coefs., Reciprocity Theorem, Stiffness Influence Coefs	
17	111/01/12 ~ 111/01/18	Final Exam Week	
18	111/01/19 ~ 111/01/25		

Requirement	Basic understanding of programming software like Excel, MATLAB, Python, Fortran, … .
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	Theory of Vibration with Applications, 5-th edition, by Thomson & Dahleh.
References	Dynamics Of Structures, by Chopra.
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：10.0 % ◆ Midterm Exam： % ◆ Final Exam： % ◆ Other〈Assignments〉：80.0 %
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.**