

Tamkang University Academic Year 111, 1st Semester Course Syllabus

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| Course Title | STRUCTURAL DYNAMICS | Instructor | CHIEH-HSUN WU |
| Course Class | TECXM1A MASTER'S PROGRAM, DEPARTMENT OF CIVIL ENGINEERING, 1A | Details | <ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester |
| Relevance to SDGs | SDG4 Quality education | | |
| D e p a r t m e n t a l A i m o f E d u c a t i o n | | | |
| <ul style="list-style-type: none"> I. Develop students' ability and knowledge of civil engineering to meet the requirements of employability and further education. II. Equip students with the ability to integrate engineering profession and information technology to strengthen their competitiveness. III. Enable students to understand the international trends, and to activate a lifelong learning concept. | | | |
| Subject Departmental core competences | | | |
| <ul style="list-style-type: none"> A. Each student should have the advanced professional knowledge of engineering design and analysis.(ratio:50.00) B. Each student should have the ability to integrate interdisciplinary knowledge and information technology.(ratio:20.00) C. Each student should have independent thinking and ability of research conducting and dissertation writing.(ratio:10.00) D. Each student should have the ability of effective communication, team work integration and leadership.(ratio:10.00) E. Each student should the concept of lifelong learning and international sustainability. (ratio:10.00) | | | |
| Subject Schoolwide essential virtues | | | |
| <ul style="list-style-type: none"> 1. A global perspective. (ratio:10.00) 2. Information literacy. (ratio:20.00) 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:10.00)

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

Course Introduction

This course introduces the basics of vibration theory which 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 |
| 2 | 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 | ABCDE | 12345678 | Lecture, Discussion | Study Assignments, Report(including oral and written) |
| 2 | AB | 5 | Lecture | Study Assignments, Report(including oral and written) |

Course Schedule

| Week | Date | Course Contents | Note |
|------|--------------------------|---------------------------------|------|
| 1 | 111/09/05 ~ 111/09/11 | Introduction/Oscillatory motion | |

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| 2 | 111/09/12 ~ 111/09/18 | Introduction/Oscillatory motion | |
| 3 | 111/09/19 ~ 111/09/25 | Free Vibration - Vibration Model, Equation of Motion | |
| 4 | 111/09/26 ~ 111/10/02 | Free Vibration - Vibration Model, Equation of Motion | |
| 5 | 111/10/03 ~ 111/10/09 | Free Vibration - Viscously Damped Free Vibration, Logarithmic Decrement, Coulomb Damping | |
| 6 | 111/10/10 ~ 111/10/16 | Free Vibration - Viscously Damped Free Vibration, Logarithmic Decrement, Coulomb Damping | |
| 7 | 111/10/17 ~ 111/10/23 | Harmonically Excited Vibr. - Forced Harmonic Vibr | |
| 8 | 111/10/24 ~ 111/10/30 | Harmonically Excited Vibr. - Forced Harmonic Vibr | |
| 9 | 111/10/31 ~ 111/11/06 | Harmonically Excited Vibr. - Rotating Unbalance | |
| 10 | 111/11/07 ~ 111/11/13 | Harmonically Excited Vibr. - Support Motion | |
| 11 | 111/11/14 ~ 111/11/20 | Harmonically Excited Vibr. - Support Motion | |
| 12 | 111/11/21 ~ 111/11/27 | 2DOF System - The Normal Mode Analysis, Initial Conditions | |
| 13 | 111/11/28 ~ 111/12/04 | 2DOF System - The Normal Mode Analysis, Initial Conditions | |
| 14 | 111/12/05 ~ 111/12/11 | Properties of Vibr. Systems - Flexibility Influence Coefs., Reciprocity Theorem, Stiffness Influence Coefs | |
| 15 | 111/12/12 ~ 111/12/18 | Properties of Vibr. Systems - Flexibility Influence Coefs., Reciprocity Theorem, Stiffness Influence Coefs | |
| 16 | 111/12/19 ~ 111/12/25 | Multi-DOF system | |
| 17 | 111/12/26 ~ 112/01/01 | Multi-DOF system | |
| 18 | 112/01/02 ~ 112/01/08 | Multi-DOF system | |
| Requirement | Please find your interest in learning this subject. | | |
| Teaching Facility | Computer | | |
| Textbooks and Teaching Materials | Theory of Vibration with Applications, 5-th edition, by Thomson & Dahleh | | |
| References | | | |
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| Number of Assignment(s) | 4 (Filled in by assignment instructor only) |
| Grading Policy | ◆ Attendance : 10.0 % ◆ Mark of Usual : 10.0 % ◆ Midterm Exam : % ◆ Final Exam : % ◆ Other (Assignment) : 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. |