

Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	ADVANCED ENGINEERING MATHEMATICS	Instructor	YANG JR-SYU
Course Class	TEBXM1A MASTER'S PROGRAM, DEPARTMENT OF MECHANICAL AND ELECTRO-MECHANICAL ENGINEERING, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG9 Industry, Innovation, and Infrastructure		
Departmental Aim of Education			
I. To prepare students who have a comprehensive understanding of the principles of applied sciences and engineering to be innovators in the field of mechanical and electromechanical engineering. II. To train emerging professionals who possess a high level of expertise and ethical standards who will become independent research and development leaders in the industry. III. To motivate students who will pursue continuing education as a means to stay on the cutting edge of global competitiveness and meet changes in their careers and the workplace with confidence and ease.			
Subject Departmental core competences			
A. Head: Knowledge of mechanical and electromechanical engineering.(ratio:40.00) B. Hand: Hands-on skills and practical realization.(ratio:20.00) C. Heart: Love of learning and innovation.(ratio:20.00) D. Eye: Vision of progress and improvements.(ratio:20.00)			
Subject Schoolwide essential virtues			
1. A global perspective. (ratio:20.00) 2. Information literacy. (ratio:20.00) 3. A vision for the future. (ratio:10.00) 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:5.00) 8. A sense of aesthetic appreciation. (ratio:5.00)			

Course Introduction	Introduce the ODE(Ordinary Differential Equation) and PDE(Partial Differential Equation) of engineering application.
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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	1.Introduce the ODE 2.Introduce Partial Differential Equation	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCD	12345678	Lecture, Experience	Testing, Study Assignments, Practicum, Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	112/09/11 ~ 112/09/17	First-Order Differential Equations	
2	112/09/18 ~ 112/09/24	First-Order Differential Equations	
3	112/09/25 ~ 112/10/01	9/29 Mid-Autumn Festival	
4	112/10/02 ~ 112/10/08	Linear Second-Order Equations	
5	112/10/09 ~ 112/10/15	Linear Second-Order Equations	

6	112/10/16 ~ 112/10/22	Linear Second-Order Equations	
7	112/10/23 ~ 112/10/29	The Laplace Transform	
8	112/10/30 ~ 112/11/05	The Laplace Transform	
9	112/11/06 ~ 112/11/12	Midterm Exam Week	
10	112/11/13 ~ 112/11/19	Matrices and Linear Systems	
11	112/11/20 ~ 112/11/26	Matrices and Linear Systems	
12	112/11/27 ~ 112/12/03	Determinants	
13	112/12/04 ~ 112/12/10	Eigenvalues ,Diagonalization, and Special Matrices	
14	112/12/11 ~ 112/12/17	Eigenvalues ,Diagonalization, and Special Matrices	
15	112/12/18 ~ 112/12/24	Systems of Linear Differential Equations	
16	112/12/25 ~ 112/12/31	Systems of Linear Differential Equations	
17	113/01/01 ~ 113/01/07	Final Exam Week	
18	113/01/08 ~ 113/01/14	Flexible Teaching Week	
Key capabilities			
Interdisciplinary			
Distinctive teaching			
Course Content		Computer programming or Computer language (students have hands-on experience in related projects) Logical Thinking	
Requirement			

Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks
References	
Grading Policy	<p>◆ Attendance : 10.0 % ◆ Mark of Usual : 20.0 % ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 30.0 %</p> <p>◆ Other ((Homework)) : 10.0 %</p>
Note	<p>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 .</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>