

Tamkang University Academic Year 107, 1st Semester Course Syllabus

Course Title	DYNAMICS	Instructor	TYAN FENG
Course Class	TENXB2B DEPARTMENT OF AEROSPACE ENGINEERING, 2B	Details	◆ Required ◆ One Semester ◆ 3 Credits
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			
I . Apply scientific knowledge and engineering techniques to analyze and solve fundamental aerospace engineering problem. II. Through fundamental theory to design and implement experiments, and be able to analyze experimental data. III. Maintain the spirit of independent thinking, self-elevate, and continuous learning. IV. Uphold the responsible attitude of work ethics and team work. V . Will have access to information, using basic knowledge, diversification, and better ability to adapt to circumstances.			
D e p a r t m e n t a l c o r e c o m p e t e n c e s			
A. With basic aerospace engineering expertise. B. Able to solve basic engineering problems via fundamental theory. C. Capable of lifelong learning and research capacity for further studies. D. To work with a sense of mission and responsibility. E. Have team spirit and the ability to communicate with each other. F. With an international perspective, have the ability to connect with the world. G. Taking full advantage of information and utilization of computer-assisted problem solving skills.			
Course Introduction	Develop an understanding of particle and planar rigid body kinematics and kinetics. Obtain an understanding of Newton's Laws of Motion, and the ability to apply energy and momentum methods to particles and rigid bodies in planar motion. Exposure to simple vibrations.		

The Relevance among Teaching Objectives, Objective Levels and Departmental 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-Characterizing, A6-Implementing

II.The Relevance among Teaching Objectives, Objective Levels and Departmental core competences :

- (i) Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objective. 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 Departmental core competences that correspond to each teaching objective. Each objective may correspond to one or more Departmental core competences at a time. (For example, if one objective corresponds to three Departmental core competences: A,AD, and BEF, list all of the three in the box.)

No.	Teaching Objectives	Relevance	
		Objective Levels	Departmental core competences
1	A knowledge of kinematic and kinetic analysis for particles and systems of particles.	C4	ABCDEFGF
2	A knowledge of momentum and energy methods for particles and systems of particles.	C4	ABCDEFGF
3	A knowledge of kinematic and kinetic analysis for rigid bodies.	C4	ABCDEFGF
4	A knowledge of momentum and energy methods for rigid bodies.	C4	ABCDEFGF
5	5.A basic understanding of vibrations in one degree of freedom systems.	C4	ABCDEFGF

Teaching Objectives, Teaching Methods and Assessment

No.	Teaching Objectives	Teaching Methods	Assessment
1	A knowledge of kinematic and kinetic analysis for particles and systems of particles.	Lecture, Discussion, Simulation, Problem solving	Written test
2	A knowledge of momentum and energy methods for particles and systems of particles.	Lecture, Discussion, Simulation, Video	Written test
3	A knowledge of kinematic and kinetic analysis for rigid bodies.	Lecture, Discussion, Simulation, Video	Written test
4	A knowledge of momentum and energy methods for rigid bodies.	Lecture, Discussion, Simulation, video	Written test

5	5.A basic understanding of vibrations in one degree of freedom systems.	Lecture, Discussion, Simulation, video	Written test
This course has been designed to cultivate the following essential qualities in TKU students			
Essential Qualities of TKU Students		Description	
◆ A global perspective		Helping students develop a broader perspective from which to understand international affairs and global development.	
◆ Information literacy		Becoming adept at using information technology and learning the proper way to process information.	
◆ A vision for the future		Understanding self-growth, social change, and technological development so as to gain the skills necessary to bring about one's future vision.	
◇ Moral integrity		Learning how to interact with others, practicing empathy and caring for others, and constructing moral principles with which to solve ethical problems.	
◆ Independent thinking		Encouraging students to keenly observe and seek out the source of their problems, and to think logically and critically.	
◇ A cheerful attitude and healthy lifestyle		Raising an awareness of the fine balance between one's body and soul and the environment; helping students live a meaningful life.	
◆ A spirit of teamwork and dedication		Improving one's ability to communicate and cooperate so as to integrate resources, collaborate with others, and solve problems.	
◇ A sense of aesthetic appreciation		Equipping students with the ability to sense and appreciate aesthetic beauty, to express themselves clearly, and to enjoy the creative process.	
Course Schedule			
Week	Date	Subject/Topics	Note
1	107/09/10 ~ 107/09/16	Kinematics of a Particle	R.C.H.12, Y.H.W.01-06
2	107/09/17 ~ 107/09/23	Kinematics of a Particle	R.C.H.12, Y.H.W.01-06
3	107/09/24 ~ 107/09/30	Kinetics of a Particle: Force and Acceleration	R.C.H.13, Y.H.W.07-14
4	107/10/01 ~ 107/10/07	Kinetics of a Particle: Force and Acceleration	R.C.H.13, Y.H.W.07-14
5	107/10/08 ~ 107/10/14	Kinetics of a Particle: Work and Energy	R.C.H.14, Y.H.W.15,16,18
6	107/10/15 ~ 107/10/21	Kinetics of a Particle: Impulse and Momentum	R.C.H.15, Y.H.W.19-22
7	107/10/22 ~ 107/10/28	Kinetics of a Particle: Impulse and Momentum	R.C.H.15, Y.H.W.19-22
8	107/10/29 ~ 107/11/04	Planar Kinematics of a Rigid Body	R.C.H.16, Y.H.W.23-28
9	107/11/05 ~ 107/11/11	Planar Kinematics of a Rigid Body	R.C.H.16, Y.H.W.23-28
10	107/11/12 ~ 107/11/18	Midterm Exam Week	

11	107/11/19 ~ 107/11/25	Planar Kinetics of a Rigid Body: Force and Acceleration	R.C.H.17, Y.H.W.29-32
12	107/11/26 ~ 107/12/02	Planar Kinetics of a Rigid Body: Force and Acceleration	R.C.H.17, Y.H.W.29-32
13	107/12/03 ~ 107/12/09	Planar Kinetics of a Rigid Body: Work and Energy	R.C.H.18, Y.H.W.33
14	107/12/10 ~ 107/12/16	Planar Kinetics of a Rigid Body: Work and Energy	R.C.H.18, Y.H.W.33
15	107/12/17 ~ 107/12/23	Planar Kinetics of a Rigid Body: Impulse and Momentum	R.C.H.19, Y.H.W.34
16	107/12/24 ~ 107/12/30	Planar Kinetics of a Rigid Body: Impulse and Momentum	R.C.H.19, Y.H.W.34
17	107/12/31 ~ 108/01/06	Three-Dimensional Kinetics of a Rigid Body (if time allows)	R.C.H.20
18	108/01/07 ~ 108/01/13	Final Exam Week	
Requirement	1. You are required to watch the following videos before coming to class. https://www.youtube.com/playlist?list=PLLbvVfERDon1xk3wGaYfXSmGa1u83mGn- 2. Work hard		
Teaching Facility	Computer, Projector		
Textbook(s)	R. C. Hibbler, "Engineering Mechanics, Dynamics", 14th ed, Pearson		
Reference(s)	J. L. Meriam, L.G. Kraige and J.N. Bolton, "Engineering Mechanics, Dynamics", 8th ed, Wiley R.W. Soutal-Little, D.J. Inman and D.S. Balint, " Engineering Mechanics, Dynamics, Computational Edition", Thomson A. Bedford and W. Fowler, "Engineering Mechanics, Dynamics", 5th ed, Pearson, Prentice Hall		
Number of Assignment(s)	8 (Filled in by assignment instructor only)		
Grading Policy	◆ Attendance : % ◆ Mark of Usual : 15.0 % ◆ Midterm Exam : 35.0 % ◆ Final Exam : 50.0 % ◆ Other < > : %		
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.		