



MODULE SPECIFICATION

Faculty of Engineering

Last Updated (22 October 2018)

1. **Module Title**
Engineering Dynamics

2. **Module Code**
EM2105

3. **Number of credits**
10

4. **Level**
2

5. **Semester**
4

6. **Pre-requisites for admission to the module**
Normal progression rules

7. **Module Coordinator**
Professor Yulfian Aminanda

8. **Aims**
To acquire basic knowledge of dynamics and build problem-solving skills for analyzing any dynamics problems that are customized to specific types of engineering problems. The general analysis and design problems are expected to represent realistic situations encountered in engineering practice/industry to stimulate the students' interest in engineering dynamics.

9. **Summary of Contents**

This module covers the following topics:

- **Particle and planar rigid body dynamics:** Kinematics and Motions; Newton's Second Law of Motion; Equations of Motion in Force and Acceleration; Principles of Work and Energy; Impulse and Momentum
- **Three-dimensional kinetics:** General and Relative Motions; Moment and Product of Inertia; Angular Momentum, Kinetic Energy; Gyroscopic and Torque-Free Motions
- **Introduction to vibration:** Un-damped Free Vibration; Energy Methods; Un-damped Forced Vibration; Viscous Damped Free Vibration; Viscous Damped Forced Vibration

10. Module Intended Learning Outcomes (MILOs)

Upon successful completion of this module, students will be able to:

No.	MILOs	Weightage (%)
1	Explain basic principles of dynamics in engineering system	20
2	Draw the free-body and kinetic diagrams for a moving body	20
3	Apply the dynamics theory in the analysis of a given engineering system	20
4	Build dynamic/kinetic models in engineering systems design.	20
5	Derive the mathematical models for free and/or forced vibration systems	20

11. Teaching and Learning Activities (TLAs)

MILO No.	TLAs	Functions	Hours/Week
1-5	Lectures	To show and build the dynamics/kinetic models for solving engineering problems	2
1-5	Tutorials	To provide extra examples/problems on dynamics/kinetic problems.	1
1-5	Laboratory	To gain experiences and competences in solving dynamics problems using available motion simulation software.	1

12. Assessment Tasks/Activities

MILO No.	Type of Assessment Tasks/Activities	Weightage (%)
1-5	University Examination	50
1-4	Class Test	10
1-5	3 Assignments	15
1-5	2 Laboratory Reports	25

Assessment Criteria:

Assessment components of the module shall be University Examination and Coursework. To achieve a pass in the module students must obtain a minimum overall mark of 40% and a minimum of 30% in each assessment component.

Resit: Students eligible for resit shall be assessed according to the programme area examination board recommendation.

13. Attendance Requirements

Students are required to attend all lectures, tutorials and laboratory sessions.

14. Contribution to Programme Intended Learning Outcomes

PILO		MILO No.				
		1	2	3	4	5
1	Science & Mathematics	✓	✓	✓	✓	✓
2	Engineering Analysis	✓	✓	✓	✓	✓
3	Design		✓	✓	✓	
4	Advanced Design				✓	
5	Economic, Legal, Social and Ethical Contexts					
6	Engineering Practice			✓	✓	
7	General Skills					

15. Grading of Student Achievement

Marks (%)	Grades	Grade Definition
85-100	A+	Excellent
75-84	A	
70-74	B+	Very Good
65-69	B	
60-64	C+	Good
55-59	C	
50-54	D+	Satisfactory
45-49	D	
40-44	E	Marginal
0-39	F	Fail

16. Resources**Primary text**

No	Name of Authors	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Russell C. Hibbeler	2016	Engineering Mechanics: Dynamics	14th	Pearson	978-0134228266

Secondary text

No	Name of Author	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Anthony M. Bedford, Wallace Fowler	2008	Engineering Mechanics: Dynamics	5th	Pearson	978-0136129165