



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form no. (12): Course Specification

1- Course Data

Course Code: ME 355	Course Title: Theory of Machines	Academic Year/Level: 3rd year / 5th semester	
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.	Practical 2 hrs.

2- Course Aim

- To provide a fair understanding of the performance of various mechanisms and principal machine elements as regards their Kinematics and dynamics

3- Intended Learning Outcomes

a- Knowledge and Understanding	Through knowledge and understanding, students will be able to: a.4) Principles of design including elements design, process and/or a system related to specific disciplines. a.p.2) Internal combustion, pumps, turbines and compressors, classification, construction design concepts, operation and characteristics
b- Intellectual Skills	Through intellectual skills, students will be able to: b.2) Select appropriate solutions for engineering problems based on analytical thinking. b.3) Think in a creative and innovative way in problem solving and design b.12) Create systematic and methodic approaches when dealing with new and advancing technology.
c- Professional Skills	Through professional and practical skills, students will be able to: c.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services c.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results
d- General Skills	Through general and transferable skills, students will be able to:

4- Course Content

Week No.1 Introduction -Types of motion.

Week No.2 Velocity analysis of machine components – instantaneous center method.

Week No.3 Acceleration analysis.

Week No.4 Acceleration analysis.

Week No.5 Dynamic force analysis – Dynamic bearing reactions.

Week No.6 Balancing of rotating masses.

Week No.7 Balancing of reciprocating masses / 7th week evaluation

Week No.8 Balancing of reciprocating masses

Week No.9 Cams

**Week
No.10** Cams

**Week
No.11** Kinetic energy storage and flywheel

**Week
No.12** Gear geometry and fundamental law of gearing / 12th week evaluation

**Week
No.13** Gear trains (conventional and epicyclic).

**Week
No.14** Gear trains (conventional and epicyclic)

**Week
No.15** Gyroscopic couples

**Week
No.16** Final Examination

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

Engineering Requirements and Design Considerations in college Buildings and its Leading Passages

- The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped;
- Doors are wide enough to let wheel chairs pass through easily and conveniently.

- Lifts are provided for movement between floors.
- Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
- Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
- Sudden changes in the floor level are prevented.

Design Considerations of the Classes

- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
- Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
- Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.
- Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.

Academic Support:

- The general academic advisor appoints an academic supervisor for handicapped students.
- Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual and general Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7 th Week Assessment 12 th Week Assessment Continuous Assessments 16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation 12 th Week Evaluation Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• • Wilson, Charles.E. , “Kinematics and Dynamics of Machinery”. Pearson Education. – Latest Edition.
c- Recommended Books	• • Shigly, “Theory of Machines”, McGraw – Hill, Latest Edition • Hamilton H. Mabie & Charles F. Reinholtz, “Mechanisms and Dynamics of machinery” , , John Wiley & Sons, Latest Edition.
d- Periodicals, Web Sites, etc.	N/A

Course Instructor: Prof. El-Sayed Saber Head of Department: Prof. El-Sayed Saber

Program Manager: Prof. El-Sayed Saber

**Dean of College of Engineering and
Technology of AASTMT**

Name: Prof. Moustafa Hussein Aly

Signature:

**Executive Manager of Quality Assurance
Center of AASTMT**

Name: Prof. Aziz Ezzat

Signature: