Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Mechanical Engineering (Mechatronics) Program

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	Lecture	Practical
	3 credits	**2 hrs.**	**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:** K4) Principles of design including elements design, process and/or a system related to specific disciplines.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** I2) Select appropriate solutions for engineering problems based on analytical thinking. I3) Think in a creative and innovative way in problem solving and design I12) 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:** P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services P5) 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:** Apply theories and concepts of mathematics and engineering principles to mechanical power systems. Apply and integrate knowledge, understanding and skills of different subjects to solve real problems in industries. Design and execute a project in the field of mechanical power engineering. Use mathematical and computational skills in solving mechanical power engineering problems. Apply industrial safety.

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

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	7th Week Assessment 12th Week Assessment Continuous Assessments 16th Week Final Written Exam
c- Weighing of Assessment	7th Week Evaluation 12th 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 coordinator: **Program Manager:**