



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 241	Course Title: Experimental methods	Academic Year/Level: 3rd year / 5th semester	
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.	Practical 2 hrs.

2- Course Aim

<ul style="list-style-type: none"> • To understand modern engineering experimentation including experiment design, system calibration, data acquisition, analysis and presentation. • To understand how to quantify error and uncertainty in physical measurements. • To gain hands-on experience with modern instrumentation and systems-level experimentation. • To improve written and oral communication skills, to develop the ability to write engineering reports of high quality, and to improve the student's ability to function as a member of an engineering team. • The professional and ethical responsibilities of mechanical power and energy engineers.

3- Intended Learning Outcomes

aa- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>K2) Basics of information and communication technology (ICT)</p> <p>K4) Principles of design including elements design, process and/or a system related to specific disciplines.</p> <p>K5) Methodologies of solving engineering problems, data collection and interpretation</p> <p>K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.</p> <p>K10) Technical language and report writing</p>
bb- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>I4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.</p> <p>I5) Assess and evaluate the characteristics and performance of components, systems and processes</p> <p>I8) Select and appraise appropriate ICT tools to a variety of engineering problems</p>
cc- Professional Skills	<p>Through professional and practical skills, students will be able to:</p> <p>P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services</p> <p>P4) Practice the neatness and aesthetics in design and approach.</p> <p>P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results</p> <p>P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.</p>

	<p>P8) Apply safe systems at work and observe the appropriate steps to manage risks.</p> <p>P10) Apply quality assurance procedures and follow codes and standards.</p> <p>P12) Prepare and present technical reports</p>
dd- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>G1) Collaborate effectively within multidisciplinary team.</p> <p>G3) Communicate effectively</p> <p>G5) Lead and motivate individuals</p> <p>G7) Search for information and engage in life-long self learning discipline</p> <p>G9) Refer to relevant literature</p>

4- Course Content

Week No.1	Introduction
Week No.2	Generalized Measuring System, Significant Digits, Rounding, Truncation
Week No.3	Data Acquisition, Signals, Signal Conditioning, Sampling
Week No.4	Lab View – Lab View Tutorial
Week No.5	Back ground and Introduction to thermal experiments
Week No.6	Background and Introduction Fluid mechanics experiments
Week No.7	Background and introduction to Material experiments / 7th week evaluation
Week No.8	Background and Introduction to solid mechanics experiments
Week No.9	Presentation & communication skills
Week No.10	Accuracy, Precision, Error in Measurement, Calibration - Lab Work
Week No.11	Uncertainty Analysis – Exercise
Week No.12	Displacement and Dimensional Measurement – Lab work / 12th week evaluation
Week No.13	Library Exercise.
Week No.14	Oral Presentation for Selected Topic
Week No.15	Oral Presentation for Selected Topic
Week No.16	Fianl 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	7 th Week Assessment
	Assessment 2	12 th Week Assessment
	Assessment 3	Continuous Assessments
	Assessment 4	16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation	30 %
	12 th Week Evaluation	20 %
	Final-term Examination	40 %
	Oral Examination	00 %
	Practical Examination	00 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Experimental Methods for engineers Text/Handout.
c- Recommended Books	<ul style="list-style-type: none"> • J.P. Holman, Experimental Methods for Engineers, McGrawHill, 2011, 5th Edition • Figliola, R. S., Beasley, D.E. (2006) "Theory and Design for Mechanical Measurements" 4th ed., John Wiley & Sons, Inc., Hoboken, NJ. ISBN: 0-471-44593-2. • Taylor, J. R. (1997), "An Introduction to Error Analysis", University Science Books, 2nd edition.
d- Periodicals, Web Sites, etc.	N/A

Course coordinator:

Program Manager: