University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: Mechanical/Marine/Construction Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
EE 218	Measurements and Instrumentation	3
Specialization: Mechanical/Marine/Construction	**No. of Instructional Units:** 3	**Lecture** 2 **Practical** 2

2- Course Aim	Investigate different methods for remote measuring to study how transducers operate and their characteristic and to study how to analyze data obtained from measurements.
3- Intended Learning Outcome	
a- Knowledge and Understanding	An understanding of the main concepts of process control, they should be conversant with the open loop, closed loop control systems and be aware of its application An understanding of the main characteristics related with the measuring instruments such as range, accuracy, error etc. Analysis of measured data and calculate the necessary statistics Study of how sensors and transducers operate and their characteristics. Measurements of pressure, level, temperature, flow, PH measurement, viscosity, displacement and velocity.

b- Intellectual Skills	Student will be able to Understand the basic concepts of parameter measurements in process control. Understand the basic characteristics of measuring instruments and how to select the suitable one. Perform the necessary statistics on the measuring data. Understand the basic levels of parameter measurements, display, on off control and automatic control.
c- Professional Skills	Know components of process control systems and the function of each component. Be able to identify properties of process control system components and the limitation of each.
d- General Skills	Being able to represent measurements analysis of process control systems.

4- Course Content	*Week Number 1:* Introduction to feedback control (1). *Week Number 2:* Introduction to feedback control (2). *Week Number 3:* Physical Measurements. *Week Number 4:* Introduction to feedback systems. *Week Number 5:* Liquid level instruments. *Week Number 6:* Liquid flow instruments. *Week Number 7:* 7th week exam + PH+Viscosity. *Week Number 8:* Displacement + velocity measurements. *Week Number 9:* Force and torque measurements. *Week Number 10:* Data analysis. *Week Number 11:* Error detectors/comparators. *Week Number 12:* 12th week + Electric/pneumatic transducers. *Week Number 13:* Cont(Amplifier transducers). *Week Number 14:* Actuation. *Week Number 15:* Revision. Week number 16:Final Exam
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports & sheets - Laboratories
6- Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Reports & sheets - Laboratories

7- Student Assessment:	
a- Procedures used:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills

b- Schedule:	**Assessment 1 Exam**	**7th Week Written**
	Assessment 2 Exam	**12th Week Written**
	Assessment 3 Assessments	**Continuous**
	Assessment 4 Written Exam	**16th Week Final**
c- Weighing of Assessment:	**7th Week Examination**	**30 %**
	12th Week Examination	**20 %**
	Final-term Examination	**40 %**
	Oral Examination	**0 %**
	Practical Examination	**0 %**
	Semester Work	**10 %**
	Total	**100%**
8- List of References:	Chesmond, C.J. "Basic control system technology" ELBS,1989 Bartelt, Terry ,"Instrumentation and process control", Thompson Delmar,2007	
a- Course Notes		
b- Required Books (Textbooks)	Johnson, Curtis, "Process control Instrumentation technology", Prentice Hall., latest edition	

c- Recommended Books	
d- Periodicals, Web Sites, …, etc.	

Course Instructor: **Head of Department:**

Program Manager: