



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

Form no. (12): Course Specification

1- Course Data

Course Code: CC415	Course Title: Data Acquisition Systems	Academic Year/Level: year 4 / semester 8
Specialization: Computer Engineering	Credit Hours: 3 Lecture: 2 Tutorial: 2 Lab: 2	Prerequisite ----- CC421

2- Course Aim

To introduce the basic techniques of automatic sensing and measurements in the non-digital world. To train students on the principles and to acquire skills in dealing with sensing different physical phenomena; mechanical, electric, electronic, and optical.

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>A3. Methodologies of solving engineering problems, data collection and interpretation.</p> <ul style="list-style-type: none"> • Demonstrate RC circuit Analysis • Identify mechanical systems composition and working mechanisms • Demonstrate binary system representation, sequential and combinational logic understanding • Differentiate ports available for use in a computer. • Demonstrate RC circuit Analysis <p>A5. Engineering principles in the fields of logic design, circuit analysis, machine and assembly languages, computer organization and architectures, memory hierarchy, advanced computer architectures, embedded systems, signal processing, operating systems, realtime systems and reliability analysis.</p> <ul style="list-style-type: none"> • Differentiate Analog / Digital signal processing and their characteristics • Identify Composition of continuous signals • Identify Discrete signals • Know C programming • Apply Mathematical computations • Identify mechanical systems composition and working mechanisms • Demonstrate binary system representation, sequential and combinational logic understanding.
b- Intellectual Skills	<p>B2. Think in a creative and innovative way in problem solving and design using the latest technologies and solve engineering problems, often on the basis of limited and possibly contradicting information while identifying symptoms in problematic situations.</p> <p>B4. Assess and evaluate the characteristics and performance of components, systems and processes and investigate their failure.</p> <p>B7. Integrate computer objects running on different system configurations.</p> <ul style="list-style-type: none"> • Discover discussion and deduction abilities • Solve engineering problems creatively. • Experiment needed components • Replace unavailable parts with ones that are at hand • Determine Real time applications • Apply logic reasoning and circuit deduction. • Demonstrate a sound point of view and good discussion

c- Professional Skills	<p>C2. Create and or redesign a process, component or system, and carry out specialized engineering designs with neatness and aesthetics in design and approach.</p> <p>C3. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment, wide range of analytical tools, techniques, and software packages pertaining to the computer engineering to design experiments, collect, analyze and interpret results and develop required computer programs.</p> <p>C5. Apply safe systems at work and observe the appropriate steps to manage risks.</p> <p>C6. Design and operate computerbased systems specifically designed for business applications.</p> <ul style="list-style-type: none"> • Use graphical representation tools. • Practice: <ul style="list-style-type: none"> • Mathematical proofing skills. • Report writing. • Online searching skills. • Coding skills. • Design Printed Circuit Board “PCB”. • Manipulate Schematic Drawing tools.
d- General Skills	<p>D1. Collaborate effectively within multidisciplinary teams.</p> <p>D2. Work in stressful environment and within constraints, communicate effectively, lead and motivate individuals and effectively manage tasks, time, and resources.</p> <ul style="list-style-type: none"> • Practice Presentation Skills

4- Course Content

Week No.1	Introduction
Week No.2	Data acquisition systems & data acquisition channel
Week No.3	Sensors & transducers
Week No.4	Signal conditioning: operational amplifiers & applications
Week No.5	Signal conditioning: operational amplifiers
Week No.6	Signal conditioning: analog filters
Week No.7	7th Week Exam + Revision
Week No.8	Review of computer interfacing techniques
Week No.9	Special applications of operational amplifiers
Week No.10	Digital to analog conversion
Week No.11	Actuators
Week No.12	12th Week Exam + Actuators
Week No.13	Analog to digital conversion.
Week No.14	Analog to digital conversion
Week No.15	Projects presentation
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars <p>The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.</p>
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7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1	7 th Week Written Exam
	Assessment 2	12 th Week Written Exam
	Assessment 3	Continuous Assessments
	Assessment 4	16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Examination	30 %
	12 th Week Examination	20 %
	Final-term Examination	40 %
	Oral Examination	0 %
	Practical Examination	0 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	Lectures are available on the moodle in pdf format
b- Required Books (Textbooks)	Floyd, Thomas L, "Fundamentals of Analog Circuits (2400)", Pearson Education 2ED
c- Recommended Books	<ul style="list-style-type: none"> • Harry N. Norton, " Sensor and Analysis Handbook ", P-H., 1982. • R.Pallas Areny, T. Webster, " Sensors and Signal Conditioning ", J. w., 1991. • Tran Tien Lang, " Computerized Instrumentation ", John Wiley & Sons., 1991. • Brufee Newby, " Electronic Signal Conditioning ", P-H., 1994
d- Periodicals, Web Sites, etc.	N/A

Course Instructor:
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Program Manager:
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Signature:

Signature: