



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: CC521	Course Title: Micro-Computer Based Design	Academic Year/Level: year 4,5 / semester 7,8,9,10
Specialization: Computer Engineering	Credit Hours: 3 Lecture: 2 Tutorial: 2 Lab: 2	Prerequisite -----

2- Course Aim

Teach student how to design and implement control board systems that employ a microcontroller in their functions. In addition to make the students able to design and implement a control panels that will replace other existing ones for maintenance and upgrading purposes. Also minimizing the cost of the system and the complexity of the circuits are taken into consideration. Finally teach the student the how to design and implement a network between many microcontrollers and/or some microcomputer systems.

3- Intended Learning Outcomes

a- Knowledge and Understanding	<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, real-time systems and reliability analysis.</p> <ul style="list-style-type: none"> • Understand the architecture and function of microcontrollers • Understand how different external input and output devices are interfaced to the microcontrollers. • Collect design methodologies to implement microcontroller based systems. • Examine the system devices and interfaces for the best performance with a minimum cost.
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> <ul style="list-style-type: none"> • Discover Discussion and Deduction abilities • Solve Engineering problems creatively. • Demonstrate a sound point of view and good discussion <p>[b4] Assess and evaluate the characteristics and performance of components, systems and processes and investigate their failure.</p> <ul style="list-style-type: none"> • Experiment needed components • Replace unavailable parts with ones that are at hand <p>[b7] Integrate computer objects running on different system configurations.</p> <ul style="list-style-type: none"> • Determine Real time applications • Apply logic reasoning and circuit deduction.

c- Professional Skills	<p>[c2] Create and/or re-design a process, component or system, and carry out specialized engineering designs with neatness and aesthetics in design and approach.</p> <ul style="list-style-type: none"> • Use graphical representation tools. • Design Printed Circuit Board “PCB”. • Manipulate Schematic Drawing tools <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> <ul style="list-style-type: none"> • Coding skills. • Mathematical proofing skills. <p>[c7] Design and operate computer-based systems specifically designed for business applications.</p> <ul style="list-style-type: none"> • Report writing. • Online searching skills.
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 to Microcontrollers
Week No.2	Programming micro controllers using assembly language
Week No.3	Programming microcontrollers using C
Week No.4	Programming microcontrollers using C
Week No.5	Embedded system design consideration
Week No.6	Embedded system design steps
Week No.7	7th Week Exam
Week No.8	Interfacing with keypad
Week No.9	Interfacing with 7-segment display
Week No.10	Interfacing with ADC and DAC
Week No.11	Dealing with serial communication
Week No.12	12th Week Exam
Week No.13	Design of final project
Week No.14	Design tools II
Week No.15	Revision
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

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

The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.

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	
b- Required Books (Textbooks)	Mazidi, Muhammad Ali, "AVR Microcontroller and Embedded Systems using Assembly and C", Pearson Education ED
c- Recommended Books	AVR Microcontroller and Embedded Systems: Using Assembly and C, Muhammad Ali Mazidi
d- Periodicals, Web Sites, etc.	N/A

Course Instructor:
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