



Course Specification of Computer Interfacing

I. Course Identification and General Information:						
1.	Course Title:	Computer Interfacing				
2.	Course Code & Number:	CCE334				
3.	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	3
4.	Study level/ semester at which this course is offered:	Forth Level / First Semester				
5.	Pre –requisite (if any):	Programming III (CCE244), Microprocessors and Assembly Language (CCE214)				
6.	Co –requisite (if any):					
7.	Program (s) in which the course is offered:	Computer Engineering and Control				
8.	Language of teaching the course:	English				
9.	Location of teaching the course:	Electrical Engineering Department				
10.	Prepared By:	Assoc. Prof. Dr. Farouk Al-Fuhaidy				
11.	Date of Approval	2020				

II. Course Description:
<p>This course is an introductory course to the human-computer interfacing. It introduces students with the hardware and software design techniques and issues for interfacing computers and peripheral devices. Topics covered by this course include; serial digital data communication & universal serial bus standards, parallel communication, and digital & analog interfacing. Finally, this course prepares students with basic concepts to the field of embedded systems and microprocessor/microcontroller interfacing including various hardware and software considerations specific to such systems.</p>

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III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a1	Describes the design principles and implementation issues related to human computer interface systems.	A2
b1	Analyze the system requirements and set goals for optimum interfacing between human and computers.	B1
b2	Recognize appropriate devices, elements, and software needed to such human computer interface system.	B3
c1	Design and implement human to computer interfacing systems that meet desired user specifications.	C2
c2	Use contemporary techniques and programming skills for implementing interfaces and build applications through prototype tools, GUI-based systems, and toolkits.	C4
d1	Enhance team working skills through collaborative projects.	D1, D2

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describes the design principles and implementation issues related to human computer interface systems.	Lectures, Computer Laboratory Sessions, Practical Lab. Work, Reading Materials & Web-sites searches, Group Works, Projects.	Examinations, homework Presentations, individual and group project reports

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(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Analyze the system requirements and set goals for optimum interfacing between human and computers.	Lectures, Computer Laboratory Sessions, Practical Lab. Work, Reading Materials & Web-sites searches, Group Works, Projects.	Examinations, homework, laboratory reports presentations, individual and group project reports
b2- Recognize appropriate devices, elements, and software needed to such human computer interface system.	Lectures, Computer Laboratory Sessions, Practical Lab. Work, Reading Materials & Web-sites searches, Group Works, Projects.	Examinations, homework, laboratory reports presentations, individual and group project reports

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- Design and implement human to computer interfacing systems that meet desired user specifications.	Lectures, Computer Laboratory Sessions, Practical Lab. Work, Reading Materials & Web-sites searches, Group Works, Projects.	Examinations, laboratory reports, presentations, individual and group project reports.
C2- Use contemporary techniques and programming skills for implementing interfaces and build applications through	Lectures, Computer Laboratory Sessions, Practical Lab. Work, Reading Materials & Web-sites	Examinations, laboratory reports, presentations, individual and group project reports.

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prototype tools, GUI-based systems, and toolkits.	searches, Group Works, Projects.	
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(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Enhance team working skills through collaborative projects.	Seminars, laboratory, Assignments, Group Work, Projects.	Presentations, individual and group Project Reports and Presentation.

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact hours
1.	Course Orientations and Introduction to Computer Interfacing	a1, b1	<ul style="list-style-type: none"> ▪ Course Subjects Overview, ▪ Introduction to Human-Computer-Interfacing (HCI), Goals & Motivations, the need & applications, Elements required by HCI and their interactions methods, Serial and parallel, ▪ Device-to-Device connections 	1	2
2.	Microprocessor Architecture & Interfacing	a1, b1	<ul style="list-style-type: none"> ▪ Microprocessor History from 4004-MPs to Core-MPs, ▪ 8088-MP architecture and processor-IC Pins functions & interfacing, Modes of operations, ▪ The 8088-MP and its interconnected ICs, Memory segmentation & interfacing to 8088-MP, the 8284-IC for Clock 	2	4

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			Generator, the 8288-Bus Controller, the Address-latch circuit, the 8259-Interrupt controller, a block diagram which interconnect these ICs with the 8088-Mp and their operations, explanation on I/O devices interfacing & Interrupts mechanism of operation and programming using Assembly or C.		
3.	Digital Data Communications Standards (Serial Communications)	a1, b1, b2, c1	<ul style="list-style-type: none"> ▪ Serial Communications, concept of digital serial communications, protocol, advantages transmission of serial data between computer and sensors or I/O devices like printers, mouse, etc. serial data transmission between computer and computer, ▪ Serial Interfaces, RS-232, Transmission characteristics, Electrical characteristics, RS-232 Connectors; DB25S as Male DTE & its 25-Pin functions and computer female socket; DB9S with 9-Pin and computer female socket; COM1 as 9 Pin connector and COM2 as 25 Pin connectors in PCs. ▪ RS-232 Frame Format, Example, Parity, Baud Rate, ▪ RS-232 Type of Equipment, DTE, DCE, and MODEM 	4	8

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			<ul style="list-style-type: none"> ▪ RS-232 communication, Handshaking, Hardware, Software, or no Handshaking, DTE to DCE connections for Handshaking, Types of Errors in Serial Communications, ▪ UART Device, the UART-8250-40 Pin IC, its 7-Registers, Clock input & Hardware Interrupts, UART Transmit & Receive, Programming RS-232 illustrated with C programs ▪ Alternative Serial Communication Standards, RS-422, USB-1&USB-2, and IEEE 1394 (Firewire / iLink), Transmission and Electrical characteristics, ▪ USB Design Goals, Motivations for Development of USB-1 and USB-2 and their characteristics, USB Host Controller characteristics, USB Transfer modes, control, interrupt, Bulk, and Isochronous, USB Connectors, USB-2.0 Suspend Mode, USB Protocols, USB Packet Structure and Types, USB Functions with Example, USB Control Transfer with Example, USB Interrupt Transfer with Example and other types of USB Transfer, 		
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			<ul style="list-style-type: none"> The IEEE-488 BUS, Digital Interface for Programmable Instrumentation, the General-Purpose Instrument Bus (GPIB), history, characteristics, and Configuration Requirements, Pin Signals functions 		
4.	Data Acquisition System and Signals Characteristics	a1, b1	<ul style="list-style-type: none"> Explanation on Data Acquisition System block diagram, and their elements and their use, Signals characteristics, problems and errors and solving 	1	2
5.	Digital Input / Output and Parallel Communications	a1, b1, b2, c1, c2	<ul style="list-style-type: none"> Parallel Vs. Serial Communications Digital I/O using the PPI 8255 IC to the MP, 8255 IC Pin functions, parallel ports and registers, interfacing, mode of operations, configuration and programming using assembly or C. Examples 	1.5	3
6.	Analogue Input / Output	a1, b1, b2	<ul style="list-style-type: none"> Analog Input devices, Analog to Digital Conversion and types Analog output devices, Digital to analog conversion 	1	2
7.	Wireless Computer Interfacing	a1, b1, b2	<ul style="list-style-type: none"> Wireless communication concepts, standards, advantages & motivation, RFID Technology Bluetooth and WiFi wireless Technology Other Modern Wireless Technologies 	1	2

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8.	Graphical Screen Design and Programming	a1, b1, b2, c1, c2	<ul style="list-style-type: none"> Graphical Screen Design Concepts, GUI-based Programming, Use of Visual Basic, VC, Java or C# programming language to design a GUI-based screen to different examples illustrating computer and human interfacing 	1.5	3
9.	Visions of the Future and Final Revision	b2, c1, d1	<ul style="list-style-type: none"> New Trends in Computer human interfacing, Final Revision 	1	2
Number of Weeks /and Units Per Semester				14	28

B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Lab View on Equipment and Software Tools required by the Lab experiments	1	2	a1, b2,
2.	Experiments on 8088-MP interfacing and programming with I/O peripherals	2	4	a1, b2, c1, c2, d1
3.	Serial Communications between computer and Peripherals based on RS232, RS422, and USB standards Know different serial standards, connectors, connect and programming the interfacing between computers and I/O devices like sensors, printers, and Camera	3	6	a1, b1, b2, c1, c2, d1
4.	Interfacing, Analog and Digital Peripherals and devices,	2	4	a1, b1, b2, c1, c2, d1

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	Connect experiment to interface 8088MP, 8255 IC and I/O devices, write assembly and C programs to these experiments and test and verify your experiments			
5.	Use advanced Programming language to build GUI programs for HCI	2	4	a1, b1, b2, c1, c2, d1
6.	Student on Groups of 2 or 3 searches websites for Wired and Wireless communication techniques like RFID, Bluetooth, Wifi to interface between computer and Human. Then work to build GUI-software program project for interfacing human and computer either wired or wireless. Finally, students present their project work	3	6	a1, b1, b2, c1, c2, d1
7.	Final Exam	1	2	a1, b1, b2, c1, c2, d1
Number of Weeks /and Units Per Semester		14	28	

V. Teaching strategies of the course:

- Active Lectures,
- Assignments
- Computer Laboratory Sessions,
- Practical Lab. Work,
- Reading Materials & Web-sites searches,
- Group Works,
- Projects.

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VI. Reports:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Serial Communications	a1, b1, b2, c1, d1	3 rd to 7 th	3.75
2.	Data Acquisition System,	a1, b1, b2	9 th	1.5
3.	Parallel Digital Communication interfacing	a1, b1, b2, c1, d1	10 th & 11 th	3
4.	Analog Interfacing	a1, b1, b2, c1, d1	12 th	1.5
5.	Wireless Interfacing	a1, b1, b2, c1, d1	13 th	1.5
6.	GUI programming & Interfacing	a1, b1, b2, c1, c2, d1	14 th & 15 th	3.75
	Total			15

VII. Schedule of Assessment Tasks for Students During the Semester:					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	HomeWorks & Assignments	3 rd to 15 th	15	10%	a1, b1, b2, c1, c2, d1
2.	Laboratory Works & Reports	3 rd to 11 th	15	10%	a1, b1, b2, c1, c2, d1
3.	Project Work & Presentation	12 th & 13 th	15	10%	a1, b1, b2, c1, c2, d1
4.	Midterm Exam (Th.)	8 th	15	10%	a1, b1, b2, c1
5.	Final Exam (Pr.)	14 th	15	10%	a1, b1, b2, c1, c2, d1
6.	Final Exam (Th.)	16 th	75	50%	a1, b1, b2, c1, c2
	Total		150	100%	

VIII. Learning Resources:
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).
1- Required Textbook(s) (maximum two).

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	1- William Buchanan- 1999-PC Interfacing Communications and Windows Programming- Ed. -Addison Wesley- ISBN-10 0201178184. 2- E. McKay – 2008- The Human-Dimensions of Human-Computer Interaction: Balancing the HCI Equation- Amsterdam: IOS Press 9781607503378 3- M. A. Mustafa- 1994 -Microcomputer Interfacing and Applications- 2 ND Ed. -Newnes 4- J. Preece, Y. Rogers and H. Sharp, John Wiley & Sons – 2015- Interaction design: Beyond Human-Computer Interaction- 4 th Ed. -ISBN-9781119088790
2- Essential References.	
	1- Ben Shneiderman- 2010- Designing the User Interface: Strategies for Effective Human-Computer Interaction 5 th edition, Addison Wesley. 2- Shneiderman B., Plaisant C., Cohen M., Jacobs S.- 2013- Designing the User Interface, 5/e - Pearson 9781292037011 3- C. Mourlas, P. Germanakos -2008- Intelligent User Interfaces: Adaptation and Personalization Systems and Technologies Systems- IGI Global 9781605660325
3- Electronic Materials and Web Sites etc.	
	1- www.useit.com 2- www.id-book.com 3- http://homepage.mac.com/bradster/iarchitect/sham.htm 4- www usernomics.com 5- www.baddesigns.com 6- Lectures prepared by Lecturer.

IX. Course Policies:	
1.	Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic
2.	Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.

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3.	<p>Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-</p>
4.	<p>Assignments & Projects: The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-</p>
5.	<p>Cheating: For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-</p>
6.	<p>Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.</p>
7.	<p>Other policies: - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy</p>

Reviewed By	<p><u>Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat</u> <u>President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi</u> <u>Name of Reviewer from the Department: Asst. Prof. Dr. Adel Ahmed Al-Shakiri</u></p>
	<p><u>Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa</u> <u>Assoc. Prof. Dr. Ahmed Mujahed</u> <u>Asst. Prof. Dr. Munasar Alsubri</u></p>

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Template for Course Plan of Computer Interfacing

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Assoc. Prof. Dr. Farouk AL-Fuhaidy		Office Hours					
Location & Telephone No.	777909818		SAT	SUN	MON	TUE	WED	THU
E-mail	farouqakh@gmail.com							

II. Course Identification and General Information:						
1.	Course Title:	Computer Interfacing				
2.	Course Number & Code:	CCE334				
3.	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	
4.	Study level/year at which this course is offered:	Fourth Level/First Semester				
5.	Pre –requisite (if any):	Programming III (CCE244), Microprocessors and Assembly Language (CCE214)				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	Computer & Control				
8.	Language of teaching the course:	English				
9.	System of Study:	Regular				
10.	Mode of delivery:	Lecture				
11.	Location of teaching the course:	Electrical Eng. Dep.				

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III. Course Description:

This course is an introductory course to the human-computer interfacing. It introduces students with the hardware and software design techniques and issues for interfacing computers and peripheral devices. Topics covered by this course include; serial digital data communication & universal serial bus standards, parallel communication, and digital & analog interfacing. Finally, this course prepares students with basic concepts to the field of embedded systems and microprocessor/microcontroller interfacing including various hardware and software considerations specific to such systems.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:
 1. Describes the design principles and implementation issues related to human computer interface systems.
 2. Analyze the system requirements and set goals for optimum interfacing between human and computers.
 3. Recognize appropriate devices, elements, and software needed to such human computer interface system .
 4. Design and implement human to computer interfacing systems that meet desired user specifications .
 5. Use contemporary techniques and programming skills for implementing interfaces and build applications through prototype tools, GUI-based systems, and toolkits.
 6. Enhance team working skills through collaborative projects.

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V. Course Content:				
A – Theoretical Aspect:				
Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours
1.	Course Orientations and Introduction to Computer Interfacing	<ul style="list-style-type: none"> ▪ Course Subjects Overview, ▪ Introduction to Human-Computer-Interfacing (HCI), Goals & Motivations, the need & applications, Elements required by HCI and their interactions methods, Serial and parallel, ▪ Device-to-Device connections 	1 st	2
2.	Microprocessor Architecture & Interfacing	<ul style="list-style-type: none"> ▪ Microprocessor History from 4004-MPs to Core-MPs, ▪ 8088-MP architecture and processor-IC Pins functions & interfacing, Modes of operations, ▪ The 8088-MP and its interconnected ICs, Memory segmentation & interfacing to 8088-MP, the 8284-IC for Clock Generator, the 8288-Bus Controller, the Address-latch circuit, the 8259-Interrupt controller, a block diagram which interconnect these ICs with the 8088-Mp and their operations, explanation on I/O devices interfacing & Interrupts mechanism of operation and programming using Assembly or C. 	2 nd ,3 rd	4
3.	Digital Data Communications Standards	<ul style="list-style-type: none"> ▪ Serial Communications, concept of digital serial communications, protocol, advantages 	4 th ,5 th ,6 th ,7 th	8

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	(Serial Communications)	<p>transmission of serial data between computer and sensors or I/O devices like printers, mouse, etc. serial data transmission between computer and computer,</p> <ul style="list-style-type: none"> ▪ Serial Interfaces, RS-232, Transmission characteristics, Electrical characteristics, RS-232 Connectors; DB25S as Male DTE & its 25-Pin functions and computer female socket; DB9S with 9-Pin and computer female socket; COM1 as 9 Pin connector and COM2 as 25 Pin connectors in PCs. ▪ RS-232 Frame Format, Example, Parity, Baud Rate, ▪ RS-232 Type of Equipment, DTE, DCE, and MODEM ▪ RS-232 communication, Handshaking, Hardware, Software, or no Handshaking, DTE to DCE connections for Handshaking, Types of Errors in Serial Communications, ▪ UART Device, the UART-8250- 40 Pin IC, its 7-Registers, Clock input & Hardware Interrupts, UART Transmit & Receive, Programming RS-232 illustrated with C programs ▪ Alternative Serial Communication Standards, RS-422, USB-1&USB-2, and IEEE 1394 (Firewire / iLink), Transmission and Electrical characteristics, 		
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		<ul style="list-style-type: none"> ▪ USB Design Goals, Motivations for Development of USB-1 and USB-2 and their characteristics, USB Host Controller characteristics, USB Transfer modes, control, interrupt, Bulk, and Isochronous, USB Connectors, USB-2.0 Suspend Mode, USB Protocols, USB Packet Structure and Types, USB Functions with Example, USB Control Transfer with Example, USB Interrupt Transfer with Example and other types of USB Transfer, ▪ The IEEE-488 BUS, Digital Interface for Programmable Instrumentation, the General-Purpose Instrument Bus (GPIB), history, characteristics, and Configuration Requirements, Pin Signals functions 		
4.	Mid-Term Exam	<ul style="list-style-type: none"> ▪ All Topics 	8 th	2
5.	Data Acquisition System and Signals Characteristics	<ul style="list-style-type: none"> ▪ Explanation on Data Acquisition System block diagram, and their elements and their use, ▪ Signals characteristics, problems and errors and solving 	9 th	2
6.	Digital Input / Output and Parallel Communications	<ul style="list-style-type: none"> ▪ Parallel Vs. Serial Communications ▪ Digital I/O using the PPI 8255 IC to the MP, 8255 IC Pin functions, parallel ports and registers, interfacing, mode of operations, configuration and programming using assembly or C. 	10 th ,11 th	3

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		<ul style="list-style-type: none"> Examples 		
7.	Analogue Input / Output	<ul style="list-style-type: none"> Analog Input devices, Analog to Digital Conversion and types Analog output devices, Digital to analog conversion 	11 th	2
8.	Wireless Computer Interfacing	<ul style="list-style-type: none"> Wireless communication concepts, standards, advantages & motivation, RFID Technology Bluetooth and WiFi wireless Technology Other Modern Wireless Technologies 	12 th	2
9.	Graphical Screen Design and Programming	<ul style="list-style-type: none"> Graphical Screen Design Concepts, GUI-based Programming, Use of Visual Basic, VC, Java or C# programming language to design a GUI-based screen to different examples illustrating computer and human interfacing 	13 th ,14 th	3
10.	Visions of the Future and Final Revision	<ul style="list-style-type: none"> New Trends in Computer human interfacing, Final Revision 	15 th	2
11.	Final Exam	<ul style="list-style-type: none"> All Topics 	16 th	2
Number of Weeks /and Units Per Semester			16	32

B - Practical Aspect:			
Order	Tasks/ Experiments	Number of Weeks	Contact hours
1.	Lab View on Equipment and Software Tools required by the Lab experiments	1 st	2

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2.	Experiments on 8088-MP interfacing and programming with I/O peripherals	2 nd ,3 rd	4
3.	Serial Communications between computer and Peripherals based on RS232, RS422, and USB standards Know different serial standards, connectors, connect and programming the interfacing between computers and I/O devices like sensors, printers, and Camera	4 th ,5 th ,6 th	6
4.	Interfacing, Analog and Digital Peripherals and devices, Connect experiment to interface 8088MP, 8255 IC and I/O devices, write assembly and C programs to these experiments and test and verify your experiments	7 th ,8 th	4
5.	Use advanced Programming language to build GUI programs for HCI	9 th ,10 th	4
6.	Student on Groups of 2 or 3 searches websites for Wired and Wireless communication techniques like RFID, Bluetooth, Wifi to interface between computer and Human. Then work to build GUI-software program project for interfacing human and computer either wired or wireless. Finally, students present their project work	11 th ,12 th ,13 th	6
7.	Final Exam	14 th	2
Number of Weeks /and Units Per Semester		14	28

VI. Teaching strategies of the course:

- Active Lectures,
- Assignments
- Computer Laboratory Sessions,
- Practical Lab. Work,
- Reading Materials & Web-sites searches,
- Group Works,

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- Projects.

VII. Reports:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Serial Communications	a1, b1, b2, c1, d1	3 rd to 7 th	3.75
2.	Data Acquisition System,	a1, b1, b2	9 th	1.5
3.	Parallel Digital Communication interfacing	a1, b1, b2, c1, d1	10 th & 11 th	3
4.	Analog Interfacing	a1, b1, b2, c1, d1	12 th	1.5
5.	Wireless Interfacing	a1, b1, b2, c1, d1	13 th	1.5
6.	GUI programming & Interfacing	a1, b1, b2, c1, c2, d1	14 th & 15 th	3.75
	Total			15

VIII. Schedule of Assessment Tasks for Students During the Semester:				
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1.	HomeWorks & Assignments	3 rd to 15 th	15	10%
2.	Laboratory Works & Reports	3 rd to 11 th	15	10%
3.	Project Work & Presentation	12 th & 13 th	15	10%
4.	Midterm Exam (Th.)	8 th	15	10%
5.	Final Exam (Pr.)	14 th	15	10%
6.	Final Exam (Th.)	16 th	75	50%
	Total		150	100%

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IX. Learning Resources:

- Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1. William Buchanan- 1999-PC Interfacing Communications and Windows Programming- Ed. -Addison Wesley- ISBN-10 0201178184.
2. E. McKay – 2008- The Human-Dimensions of Human-Computer Interaction: Balancing the HCI Equation- Amsterdam: IOS Press 9781607503378
3. M. A. Mustafa- 1994 -Microcomputer Interfacing and Applications- 2ND Ed. -Newnes
4. J. Preece, Y. Rogers and H. Sharp, John Wiley & Sons – 2015- Interaction design: Beyond Human-Computer Interaction- 4th Ed. -ISBN-9781119088790

2- Essential References.

1. Ben Shneiderman- 2010- Designing the User Interface: Strategies for Effective Human-Computer Interaction 5TH edition, Addison Wesley.
2. Shneiderman B., Plaisant C., Cohen M., Jacobs S.- 2013- Designing the User Interface, 5/e - Pearson 9781292037011
3. C. Mourlas, P. Germanakos -2008- Intelligent User Interfaces: Adaptation and Personalization Systems and Technologies Systems- IGI Global 9781605660325

3- Electronic Materials and Web Sites etc.

1. www.useit.com
2. www.id-book.com
3. <http://homepage.mac.com/bradster/iarchitect/sham.htm>
4. www.usernomics.com
5. www.baddesigns.com
6. Lectures prepared by Lecturer.

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X. Course Policies:	
1.	<p>Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic</p>
2.	<p>Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.</p>
3.	<p>Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-</p>
4.	<p>Assignments & Projects: The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-</p>
5.	<p>Cheating: For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-</p>
6.	<p>Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.</p>
7.	<p>Other policies:</p> <ul style="list-style-type: none"> - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. <p>Lecture notes and assignments my given directly to students using soft or hard copy</p>

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