



Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems
Technologies



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Computer Maintenance		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CST108		
ECTS Credits			
SWL (hr./Sem)	44		
Module Level	1	Semester of Delivery	
Administering Department	Computer Systems Department	College	Institute of Management - Nineveh
Module Leader	Osama.Y. Mohammed	e-mail	Osama.yassin@ntu.edu.iq
Module Leader's Acad. Title	assistant teacher	Module Leader's Qualification	Master's degree in Computer Science
Module Tutor		e-mail	
Peer Reviewer Name	Computer Organization and Design- The Hardware Software Interface David A. Patterson and John L. Hennessy	e-mail	E-mail
Scientific Committee Approval Date	09/04/2024	Version Number	1.0



Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems
Technologies



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Provide the student with the knowledge of the scientific methods and practical skills necessary in recognizing the most important methods of computer maintenance. 2. Know the most important modern programs needed to maintain the software environment needed to ensure the efficiency of the computer's work. 3. Knowing the remedial means in the maintenance of damaged parts in the physical entity of the computer.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Understand the principles of operation of the equipment and devices that make up the computer itself 2. Prepare and employ the experiences gained in this course for the purpose of conducting proper diagnosis of malfunctions and ways to identify the cause. 3. Performing remedial maintenance after identifying the cause and the continuity of work of this device and what are the preventive requirements to avoid the occurrence of errors in the future.
<p>Indicative Contents المحتويات الإرشادية</p>	<ol style="list-style-type: none"> 1. Minimize maintenance expenses by relying on preventive maintenance and device protection to increase the reliability and longevity of the electronic device 2. Revive damaged devices, if possible, with remedial maintenance procedures



Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems
Technologies



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ol style="list-style-type: none"> 1. Explain the scientific material to students in detail. 2. Participate in identifying the type of error in the operation of the computer and then discovering the cause 3. Engage students in maintenance procedures, how to find faults and the methods of the process used to fix them 4. Discussion and debate on vocabulary related to the topic
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ٥١ أسبوعاً

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	15	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	-	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	45		



Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems
Technologies



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)		LO #1, 2, 5 and 6
	Assignments	2	20% (20)		LO # 2, 4, 5 and 6
Summative assessment	Midterm Exam	2hr	10% (10)		LO # 1-8
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Material Covered	
Week 1	<ul style="list-style-type: none"> An introduction to computer components and their importance in applied life Definition of maintenance and procedures necessary to maintain the device and continue its operation during its operational life
Week 2	<ul style="list-style-type: none"> Software requirements and equipment needed to perform maintenance Types of maintenance: preventive maintenance and Treatment maintenance
Week 3	<ul style="list-style-type: none"> Preventive maintenance procedures are necessary to benefit from the computer for the longest possible period without interruption Methods of providing a suitable environment for preventive maintenance purposes, taking into account temperature, humidity, static electrical discharge, dust, fluctuations in the power source, and protection from viruses.
Week 4	<ul style="list-style-type: none"> Treatment maintenance methods and requirement, including hardware maintenance such as mouse, keyboard and software component maintenance, which includes intangible components such as the operating system and hardware drivers.
Week 5	<ul style="list-style-type: none"> A brief introduction to the hardware components of a computer, such as input units, output units, ports, public buses, basic storage units, and the



	central processing unit
Week 6	<ul style="list-style-type: none"> • Software components are the intangible components that complete the work of the computer and represent its soul, such as operating programs, driver programs, development programs, and application programs
Week 7	<ul style="list-style-type: none"> • How do computer components work together? • Feedback- QUIZ
Week 8	<ul style="list-style-type: none"> • Power supply unit. • What does a power supply consist of? • Types of power supplies AT, ATX • Wire colors and different voltages coming out of the power supply
Week 9	<ul style="list-style-type: none"> • Types of power connections, function of each wire in the connections for the disk drive, floppy drives, hard disk drive, and SATA hard drive connections. • Procedures for determining the cause of power equipment malfunction
Week 10	<ul style="list-style-type: none"> • Identify the main piece of the computer, the motherboard • Motherboard functions • Motherboard components, processor socket, random memory socket, expansion slot (RAM slot, Industry Standard Architecture, Extended Industry Standard Architecture, Peripheral component Interconnect, Accelerated Graphics Port, Peripheral component Interconnect Express, etc.) • chipset, north bridge and south bridge chipsets
Week 11	<ul style="list-style-type: none"> • basic input and output system chip (BIOS) • Basic programs for BIOS • Power on self-test (POST) • BIOS Setup • Bootstrap • CMOS Chip • BIOS Boot Sequence
Week 12	<ul style="list-style-type: none"> • Types of internal buses (Address Bus, Address Bus, Control Bus) • Types of computer ports (Power port, PS2 port, COM port, VGA display port, DP25 parallel port, RJ45 Ethernet port, S-Video port, DVI parallel port, HDMI port, Universal serial bus port and its types, Fire wire IEEE port, modem RJ11 port, mini–Audio Jack)
Week 13	<ul style="list-style-type: none"> • Central Processing Unit • Processor working principle • The basic components of the processor (Arithmetic and Logic Unit, Control Unit, Registers)



	<ul style="list-style-type: none"> • Internal cache memory • memory cache levels, system clock, clock frequency, processor speed, internal processor speed, external processor speed • processor cooling, heatsink, cooling fan • common malfunctions that affect the processor and the causes, and ways to address them
<p>Week 14</p>	<ul style="list-style-type: none"> • Types of main memory in a computer system • Read-only memory and its types (Programmable ROM, Erasable Programmable ROM, Electrical Erasable Programmable ROM) • Random access memory and its types (Dynamic RAM, Static RAM) • Techniques for connecting random access memory chips to the motherboard (Single Inline Memory Module, Dual In-Line memory Module, Rambus In-line Memory Module) • Synchronous DRAM, Double Date Rate SDRAM, DDR2, Dual-channel feature
<p>Week 15</p>	<ul style="list-style-type: none"> • Formatting the hard disk • Types of file systems • Partition hard disk • Types of operating systems and their installation



Delivery Plan (Weekly Lab. Syllabus)

للمنهج الأسبوعي للمختبر

	Material Covered
Week 1	<ul style="list-style-type: none"> Identifying the computer and how to turn it on and off Learn about the basic components of a computer and its accessories: mouse, keyboard, screen, headset, microphone, headphone, etc.
Week 2	<ul style="list-style-type: none"> Methods of providing a suitable environment for preventive maintenance purposes, taking into account temperature, humidity, static electrical discharge, dust, fluctuations in the power source
Week 3	<ul style="list-style-type: none"> Treatment maintenance methods, tools and requirement Types of maintenance: preventive maintenance and Treatment maintenance
Week 4	<ul style="list-style-type: none"> A hardware component of a computer, such as input units and how its work (mouse, keyboard, speakers)
Week 5	<ul style="list-style-type: none"> , output units and how its work (monitor, data show, printer)
Week 6	<ul style="list-style-type: none"> Basic programs for maintenance, Scandisk Check Disk, defragment software component maintenance, which includes intangible components such as the operating system repair disk and hardware drivers update
Week 7	<ul style="list-style-type: none"> Hardware: component of the case and how Assemble the basic components of a computer Hard disk drive components Disk drive components
Week 8	<ul style="list-style-type: none"> Power supplies, difference between types, Components, wire shapes, connection method, internal components
Week 9	<ul style="list-style-type: none"> power connectors design, function and voltage of each wire in the connections for the disk drive, floppy drives, hard disk drive, and SATA hard drive connections. Procedures for determining the cause of power equipment malfunction
Week 10	<ul style="list-style-type: none"> Motherboard components, processor socket, random memory socket, expansion slot, chipset, north bridge and south bridge chipsets 4. Assemble the basic components of motherboard
Week 11	<ul style="list-style-type: none"> Power on self-test (POST) procedure BIOS Setup CMOS Chip battery remover and reset BIOS Boot Sequence



Week 12	<ul style="list-style-type: none"> Introduce to Types of computer ports (Power port, PS2 port, COM port, VGA display port, DP25 parallel port, RJ45 Ethernet port, S-Video port, DVI parallel port, HDMI port, Universal serial bus port and its types, Fire wire IEEE port, modem RJ11 port, mini–Audio Jack)
Week 13	<ul style="list-style-type: none"> introduce to types of CPU Assemble the basic components of CPU (main chip of CPU, processor coolant, heatsink, cooling fan How to measure processor speed Read the processor version, cache amount, and temperature <ul style="list-style-type: none"> □ common malfunctions that affect the processor and the causes, and ways to prevent them
Week 14	<ul style="list-style-type: none"> Types of main memory in a computer system Random access memory and its types RAM cleaning, maintenance Check RAM performance common malfunctions that affect the RAM and the causes, and ways to prevent them
Week 15	<ul style="list-style-type: none"> Formatting the hard disk Partition hard disk Troubleshooting Windows Format And setup utilities applications

Learning and Teaching Resources		
مصادر التعلم والتدريس		
		Available in the Library?
Required Texts	- المختصر في تركيب وصيانة الحاسوب م. ليلي جاس محمد اليوسف ا.م. رائد عبد القادر حامد الدباغ - Computer Organization and Architecture William Stallings - Computer Organization and Design- The Hardware Software Interface David A. Patterson and John L. Hennessy	NO
Recommended Texts		
Websites		



Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems
Technologies



Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54). The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.