MODULE DESCRIPTION FORM

Module Information					
Module Title	**Computer II**			**Module Delivery**	
Module Type	**B**			☑ Theory ☑ Lecture ☑ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	**URCOM2**				
ECTS Credits	**3**				
SWL (hr/sem)	**75 H/Sem.**				
Module Level	2	**Semester of Delivery**	4		
Administering Department	Laser engineering	**College**	College of Engineering		
Module Leader	Sajjad zyara	**e-mail**	sajjad.zyara@alayen.edu.iq		
Module Leader's Acad. Title	Asst. Lec.	**Module Leader's Qualification**	MSc		
Module Tutor	Sajjad zyara	**e-mail**	sajjad.zyara@alayen.edu.iq		
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date		**Version Number**	1.0		

Relation with other Modules			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Fundamental concepts of computer systems and programming – advanced programming concepts (arrays, functions, and pointers) – object-oriented programming principles (classes, objects, inheritance, and polymorphism) – data structures basics (lists, stacks, queues) – file handling and data storage – introduction to algorithms and problem-solving techniques – debugging and testing methods – basic concepts of software development and applications

Module Learning Outcomes	Knowledge	A1	A1.1: Understand network fundamentals, including types of networks (LAN, WAN, MAN), basic network components, and layered architectures. A1.2: Describe the fundamental concepts of electronic banking services, including online banking, ATM and debit card services, phone banking, and SMS banking. A1.3 Explain the structure and functioning of AI-driven mobile technologies, including virtual assistants (Siri, Google Assistant, Alexa), adaptive learning, and real-time translation services. A1.4 Discuss the foundations of artificial intelligence, including its definition, history, key characteristics, benefits, challenges, and ethical considerations.
		A4	A4.1 Recognize and analyze different types of network topologies and communication protocols, and understand their use in diverse networking applications, including security threats. A4.2 Identify and evaluate the characteristics of AI applications in various industries, such as education, healthcare, transportation, marketing, and advertising A4.3 Apply troubleshooting techniques to identify and solve common hardware and software problems encountered by computer users. A4.4 Estimate and analyze the impact of AI on society, including social effects, international relations, and the future of humanity. A4.5 Implement understanding of AI ethics, including privacy, surveillance, and the impact of AI on the job market. A4.6 Develop awareness of future trends in AI, including recent research and emerging technologies A4.7 Apply knowledge of AI tools and applications to real-world scenarios and practical tasks across different industries.
	Skills	B1	B.1.1 Function efficiently as an individual B.1.2 Function as a member of multidisciplinary and multicultural teams
		B3	B.3.1 Acquire and apply new knowledge. B.3.2 Practice the strategies of searching for information in life-long self-learning
	Ethics	C3	C.3.1 Utilize contemporary technologies C.3.2 Make use of codes of practice and standards, quality guidelines
Indicative Contents	Unit 1: Introduction to Networks and Security (6 hours) • Definition of computer and communication networks • Types of networks (LAN, MAN, WAN) • Network topologies • Basic network components (routers, switches, hubs) • Introduction to network security		

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- Common network threats and vulnerabilities
- Basic security measures (firewalls, encryption, authentication)

Unit 2: Network Models, Protocols, and E-Commerce (8 hours)

- OSI model and TCP/IP model
- Data link and transport protocols
- Electronic Banking Services:
  - Online banking systems
  - ATM and debit card services
  - Phone banking and SMS banking
- Security protocols in e-commerce (SSL/TLS, secure transactions)

Unit 3: Computer Troubleshooting and Maintenance (8 hours)

- Identifying common hardware problems (CPU, RAM, storage, power supply)
- Identifying common software problems (OS errors, malware, driver issues)
- Troubleshooting methodology
- Preventive maintenance techniques
- Data backup and recovery
- System optimization and performance tuning

Unit 4: Introduction to Artificial Intelligence (8 hours)

- Definition of AI
- History and evolution of AI
- Key characteristics of AI
- AI techniques and approaches:
  - Machine Learning
  - Deep Learning
  - Natural Language Processing
  - Computer Vision
- Benefits of AI
- Challenges and limitations of AI

Unit 5: AI in Modern Smartphones (6 hours)

- AI-driven mobile technologies
- Virtual assistants:
  - Siri, Google Assistant, Alexa
  - Voice recognition and natural language understanding
- Adaptive learning in smartphones
- Real-time translation services
- AI-powered camera features (scene recognition, image enhancement)
- On-device AI vs cloud-based AI

Unit 6: Applications and Tools of AI (6 hours)

- AI in Education:

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- Personalized learning
  - Intelligent tutoring systems
  - Automated grading
- AI in Healthcare:
  - Medical diagnosis
  - Drug discovery
  - Wearable health monitoring
- AI in Transportation:
  - Autonomous vehicles
  - Traffic management
  - Route optimization
- AI in Marketing and Advertising:
  - Targeted advertising
  - Customer behavior analysis
  - Chatbots and customer service

Unit 7: AI and Society (6 hours)

- How AI affects social interactions
- AI and international relations
- AI in governance and public services
- AI and the future of humanity
- Digital divide and accessibility
- AI in developing countries

Unit 8: Ethical Challenges in AI (6 hours)

- AI ethics: principles and frameworks
- Privacy and surveillance concerns
- Data collection and user consent
- Bias and fairness in AI algorithms
- Impact of AI on the job market
- Automation and workforce displacement
- Reskilling and upskilling needs
- Ethical decision-making in AI development

Unit 9: The Future of AI and Emerging Technologies (6 hours)

- Future trends in AI:
  - Generative AI
  - Explainable AI (XAI)
  - Edge AI
  - Quantum AI
- Recent research and breakthroughs
- Emerging technologies:
  - AI and robotics
  - AI and blockchain
  - AI and augmented reality (AR)
- Preparing for an AI-driven future

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	Unit 10: Practical Applications and Case Studies (6 hours)
	• Hands-on examples of AI tools
	• Case studies:
	  o Successful AI implementations in industry
	  o Failures and lessons learned
	• Project work: Designing a simple AI-based solution
	• Review and preparation for final exam

Learning and Teaching Strategies

Strategies	• Presentation • Interactive learning • Discussions • Brainstorming • Group Solving Problems • Problem-Based Learning • Self-learning

Student Workload (SWL)

Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	27	**Unstructured SWL (h/w)**	1.8
Total SWL (h/sem)	75		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	LOs
Week 1	introduction to Networks and Security	A1.1, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 2	Network Topologies, Protocols, and E-Commerce Basics	A1.2, A1.3, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 3	Network Models and Security Protocols	A1.3, A4.1, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 4	TCP/IP Model and Digital Banking	A1.4, A4.3, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 5	Computer Troubleshooting and Maintenance	A1.4, A4.4, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2

Week 6	Introduction to Artificial Intelligence	A1.3, A4.5, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 7	Midterm Exam	A1.3, A4.5, B1.1, B1.2, B3.1, B3.2, C3.1
Week 8	AI in Modern Smartphones	A1.4, A4.6, B1.1, B1.2, B3.1, B3.2, C3.1
Week 9	Real-Time AI Services and Applications	A1.4, A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 10	Applications of AI in Industries	A1 – A1.4
Week 11	Applications of AI in Industries (Continued)	A1.2, A4.6, B1.1, B1.2, B3.1, B3.2, C3.1
Week 12	AI and Society	A1.2, A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 13	Ethical Challenges in AI	A1.3, A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 14	The Future of AI and Emerging Technologies	A1 , A3 , A4
Week 15	Final Exam	All

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر		
	Material Covered	**Los**
Week 1	Lab Orientation	A4.1, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 2	LAN Configuration	A4.1, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 3	Packet Tracer Simulation	A4.1, B1.1, B1.2, B3.1, B3.2, C3.1
Week 4	Arduino Basics	A4.3, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 5	Temperature Sensor	A4.4, B1.1, B1.2, B3.1, B3.2, C3.1, C3.2
Week 6	Ultrasonic Sensor	A4.5, B1.1, B1.2, B3.1, B3.2, C3.1

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Week 7	Midterm Practical	A4.5, B1.1, B1.2, B3.1, B3.2, C3.1
Week 8	LDR Sensor	A4.6, B1.1, B1.2, B3.1, B3.2, C3.1
Week 9	ADC Implementation	A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 10	ESP32 WiFi Module	A4 – A4.7
Week 11	Wireless Data Transmission	A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 12	IoT Data Monitoring	A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 13	Mini Project Development	A4.7, B1.1, B1.2, B3.1, B3.2, C3.1
Week 14	Project Presentation	A4.5, B1.1, B1.2, B3.1, B3.2, C3.1
Week 15	Final Practical Exam	A4.6, B1.1, B1.2, B3.1, B3.2, C3.1

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	A1, A4
	Assignments	2	10% (10)	2, 4,6,8,10 and 12	A1, A4
	Projects / Lab.	1	10% (10)	14	A1, A4, B1, B3, C3
	Report	1	10% (10)	13	A1, A4, B1, B3
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	A1, A4
	Final Exam	3hr	50% (50)	15	A1, A4
Total assessment			100% (100 Marks)		

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Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Computer Troubleshooting and Maintenance: A Practical Guide. 2. Artificial Intelligence: A Modern Approach.	Yes
Recommended Texts	1. Understanding AI: A Guide to Artificial Intelligence. 2. Network Security Essentials: Applications and Standards	NO
Websites	https://eng.alayen.edu.iq//colleges/e/42	

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.