



## Module Aims, Learning Outcomes and Indicative Contents

<b>Module Aims</b>	<p>The primary goal of this module is to transition students from basic computer literacy to becoming <b>technologically competent and security-aware</b> users who understand advanced concepts like networking and modern IT challenges.</p> <p>Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> <li>1. <b>Analyze and Secure Systems:</b> Identify common network architectures, analyze security threats (<b>malware, phishing</b>), and apply foundational defensive measures like firewalls and strong authentication.</li> <li>2. <b>Conduct E-Commerce Safely:</b> Differentiate between various electronic banking channels (<b>online, mobile, ATM</b>), verify transaction security protocols (<b>HTTPS, 2FA</b>), and engage in digital commerce with confidence.</li> <li>3. <b>Perform Technical Troubleshooting:</b> Apply systematic methodologies to diagnose and resolve typical hardware and software errors, utilizing system utilities and data <b>backup</b> strategies.</li> <li>4. <b>Grasp AI Fundamentals:</b> Define <b>Artificial Intelligence (AI)</b>, differentiate between key concepts (<b>ML, Deep Learning</b>), and recognize the role of AI in modern applications like virtual assistants and translation services.</li> <li>5. <b>Evaluate Ethical and Societal Impact:</b> Critically analyze the <b>ethical challenges</b> posed by AI, including issues of <b>bias, privacy, and job displacement</b>, fostering a responsible perspective on emerging technologies.</li> </ol>
<b>Module Learning Outcomes</b>	<p>Upon successful completion of this module, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. <b>Differentiate Network Types:</b> Distinguish between <b>LAN, WAN, and MAN</b> and explain the function of core network components (<b>routers, switches</b>) in each.</li> <li>2. <b>Apply Security Measures:</b> Identify common cyber threats (<b>phishing, malware</b>) and articulate how a <b>firewall</b> and <b>antivirus</b> software contribute to system defense.</li> <li>3. <b>Perform Secure Access:</b> Explain and demonstrate the rationale and steps for using <b>Two-Factor Authentication (2FA)</b> and secure password practices.</li> <li>4. <b>Verify Secure Transactions:</b> Identify the <b>HTTPS protocol</b> and the <b>SSL/TLS certificate</b> in a web browser to verify the security of an online banking transaction.</li> <li>5. <b>Compare E-Banking Channels:</b> Contrast the functionalities and security features of <b>online banking, mobile banking, and ATM services</b>, including the technology behind <b>EMV chip</b> cards.</li> <li>6. <b>Evaluate Digital Wallets:</b> Explain the concept of <b>Tokenization</b> and its role in securing payments made via <b>Digital Wallets</b> (e.g., Apple Pay, Google Pay).</li> <li>7. <b>Systematically Diagnose Issues:</b> Implement a systematic troubleshooting cycle to diagnose whether a problem is <b>hardware or software</b> related.</li> <li>8. <b>Utilize System Utilities:</b> Use operating system tools (<b>Task Manager, Activity Monitor, Disk Utility</b>) to analyze system resource consumption (<b>CPU, RAM</b>) and optimize performance.</li> <li>9. <b>Implement Data Protection:</b> Differentiate between <b>backup</b> types (e.g., full vs. incremental) and configure a basic <b>system restore point</b> or backup plan.</li> <li>10. <b>Define AI Concepts:</b> Accurately define and distinguish between the fields of <b>Artificial Intelligence, Machine Learning, and Deep Learning</b>.</li> <li>11. <b>Identify Mobile AI Applications:</b> Explain how <b>Natural Language Processing (NLP)</b> and <b>Speech Recognition</b> enable the functionality of <b>Virtual Assistants</b> (e.g., Siri, Alexa) and <b>Real-Time Translation</b>.</li> <li>12. <b>Analyze AI Applications:</b> Provide examples of how AI is used for <b>predictive modeling</b> in diverse sectors such as healthcare, finance (<b>fraud detection</b>), and</li> </ol>

	<p>autonomous transportation.</p> <p>13. <b>Assess Ethical Implications:</b> Critically evaluate the ethical implications of AI, specifically addressing issues of <b>Algorithmic Bias, data privacy, and the societal impact of automation and job displacement.</b></p>
<p><b>Indicative Contents</b></p>	<ul style="list-style-type: none"> <li>• <b>Network Fundamentals:</b> Definition of a computer network (LAN, WAN, MAN). Basic components (router, switch, NIC). Addressing and identification (IP vs. MAC address).</li> <li>• <b>Cybersecurity Basics:</b> The CIA triad (Confidentiality, Integrity, Availability). Common threats (Malware, Viruses, Phishing, DoS). Role of firewalls and antivirus software.</li> <li>• <b>E-Commerce and E-Banking:</b> Concepts of electronic banking. Functions and security of <b>ATM and Debit/Credit Card</b> services (EMV chip technology). Features of <b>Online Banking</b> and <b>Mobile Banking</b>. Security protocols (<b>HTTPS, SSL/TLS, 2FA</b>).</li> <li>• <b>Troubleshooting Methodology:</b> The systematic cycle for problem solving (Identify, Diagnose, Fix, Verify). Differentiating between hardware and software failures.</li> <li>• <b>Diagnostic Tools:</b> Use of OS utilities (<b>Task Manager/Activity Monitor</b>) to analyze resource consumption (CPU, RAM). Disk management and optimization.</li> <li>• <b>Data Protection and Recovery:</b> Importance of <b>backup</b> and different backup strategies. Creating and utilizing <b>System Restore Points</b>. Managing and updating device <b>Drivers</b>.</li> <li>• <b>Introduction to AI:</b> Definition, history (Turing Test), and core concepts. Distinctions between <b>AI, Machine Learning (ML), and Deep Learning</b>. The role of data sets and algorithms.</li> <li>• <b>AI in Mobility:</b> Principles of <b>Virtual Assistants</b> (Siri, Alexa). Technologies: <b>Natural Language Processing (NLP)</b> and <b>Speech Recognition</b>. Adaptive learning and recommendation systems.</li> <li>• <b>Ethical Foundation:</b> Introduction to core ethical issues: <b>bias, accountability, and transparency</b> in AI systems.</li> <li>• <b>AI Applications:</b> Use cases across major industries: Healthcare (diagnosis, drug discovery), Finance (<b>Fraud Detection, Algorithmic Trading</b>), Transportation (<b>Autonomous Vehicles</b>), and Marketing.</li> <li>• <b>Robotics and Automation:</b> Concepts of <b>Robotics</b> and <b>Process Automation</b> (Chatbots).</li> <li>• <b>AI and Society:</b> Societal and economic impact of AI (<b>Job Displacement, Digital Divide</b>). Analysis of privacy and <b>surveillance</b> issues.</li> <li>• <b>Future Trends:</b> Emerging technologies such as <b>Explainable AI (XAI), Quantum Computing, and Reinforcement Learning</b>.</li> </ul>

## Learning and Teaching Strategies

<b>Strategies</b>	<p><b>Lectures:</b> Engaging and interactive lectures to introduce new concepts, theories, and problem-solving techniques.</p> <p><b>Hands-on Practice:</b> Active engagement and practical exercises are key to learning computer software effectively.</p> <p><b>Demonstration and Explanation:</b> Instructors demonstrate software features and explain concepts using examples and visuals.</p> <p><b>Step-by-Step Tutorials:</b> Providing clear instructions and visuals helps learners follow along and grasp software functionalities.</p> <p><b>Collaborative Learning:</b> Encouraging collaboration among learners through group projects or peer feedback fosters a supportive learning environment.</p> <p><b>Online Resources and Documentation:</b> Supplementing learning with online resources, official documentation, and forums enhances understanding and troubleshooting.</p> <p><b>Real-World Applications:</b> Relating software learning to real-world scenarios increases student engagement and practical relevance.</p>
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## Student Workload (SWL)

<b>Structured SWL (h/sem)</b>	63	<b>Structured SWL (h/w)</b>	4.2
<b>Unstructured SWL (h/sem)</b>	12	<b>Unstructured SWL (h/w)</b>	0.1
<b>Total SWL (h/sem)</b>	<b>72 + 3 final = 75</b>		

Module Evaluation							
		Time/Number		Weight (Marks)		Week Due	Relevant Learning Outcome
		TH	LAB	TH	LAB		
Formative assessment	Quizzes	2	2	4	10	5 and 11	3,7
	Homework assignment	2	1	4	10	6 and 13	1,8
	Onsite Assignments	-	-	-	-	Continuous	All
	Projects	1	7	2	10	14	All
Summative assessment	Midterm Exam	1		10		7	
	Final Exam	3hr		50		15	
Total assessment				100 Marks			

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Security and Networking: Definition of a network; Types of networks; Basic network components.
Week 2	Security and Networking (Cont.): Network Security Basics; Understanding network threats.
Week 3	E-Commerce: Concepts of Electronic banking services including online banking, ATM, debit card services, Phone banking, SMS banking, electronic alert, Mobile banking.
Week 4	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter.
Week 5	Computer Troubleshooting (Cont.): Basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 6	Introduction to AI: Definition of AI; History of AI; AI Techniques and Approaches.
Week 7	Introduction to AI (Cont.): Key Characteristics of AI; Benefits of AI; Challenges and Ethical considerations.
Week 8	The Role of AI in Modern Smartphones: AI-Driven Mobile Technologies; Virtual Assistants (Siri, Google Assistant, Alexa).
Week 9	The Role of AI in Modern Smartphones (Cont.): Adaptive Learning; Real-Time Translation Services.
Week 10	Applications and Tools of AI: Overview of AI Applications in various Industries (Education and Healthcare).
Week 11	Applications and Tools of AI (Cont.): Overview of AI Applications (Transportation, Marketing and Advertising).
Week 12	Applications and Tools of AI (Cont.): Overview of AI Applications (Finance, Robotics and Automation Technologies).
Week 13	AI and Society: How AI affects social and international relations; AI and the future of humanity.
Week 14	Ethical Challenges in AI: AI ethics; privacy and surveillance; the impact of AI on the job market.
Week 15	The Future of AI: Future trends in AI; recent research and emerging technologies.

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Functions & Files, Working with Data Files (read and write data file).
Week 2	Lab 2: Programming Techniques: Image Types , •Indexed images, •Intensity (or grayscale) images, •RGB images, Convert signals from an image sensor into digital images, Examples of convert between Image Types, Convert Between Data Types, Examples of Image Rotation and Scale, Read Image, Show Image.
Week 3	Lab 3: Read, write, display images, Image Rotation and Scale, Contrast Adjustment, Histogram Equalization
Week 4	Lab 4: Rank and Max-Min Filters
Week 5	Lab 5: Edge Detection, Thresholding, Morphological (Dilation and Erosion) Operations and Corners on Image, Template Matching and Texture.
Week 6	Lab 6: Create Gray-Level Co-occurrence (GLCM) Matrix from image, Image Segmentation Polynomial and Global thresholds
Week 7	Lab 7: Classification and Clustering , Perceptron Network

## Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> <li>• Graham Brown, David Watson, "<b>Cambridge IGCSE Information and Communication Technology</b>", 3rd Edition (2020).</li> <li>• Alan Evans, Kendall Martin, Mary Anne Poatsy, "<b>Technology In Action Complete</b>", 16th Edition (2020).</li> </ul>	No
Recommended Texts	<ul style="list-style-type: none"> <li>• Ahmed Banafa, "<b>Introduction to Artificial Intelligence (AI)</b>", 1st Edition (2024).</li> </ul>	No
Websites	Google AI (مبادرة الذكاء الاصطناعي من جوجل)	

## Grading Scheme

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