

Module (Course Syllabus) Catalogue 2024-2025

College/ Institute	Erbil Technical Engineering	
Department	Information Systems Engineering	
Module Name	Advanced Internet	
Module Code		
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input type="checkbox"/> High
	Diploma <input type="checkbox"/> Master <input checked="" type="checkbox"/>	PhD <input type="checkbox"/>
Semester	First	
Qualification	PhD	
Scientific Title	Lecturer	
ECTS (Credits)	8	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	3	Total Workload=(162) hrs
Weekly hours (Theory)	(3)hr Class	(36)Total hrs Workload
Weekly hours (Practical)	()hr Class	()Total hrs Workload
Number of Weeks	15 Week	
Lecturer (Theory)	Dr. Diana Hussein	
E-Mail & Mobile NO.	diana.hussein@epu.edu.iq	
Lecturer (Practical)		
E-Mail & Mobile NO.		

Course Book

<p>Course Description</p>	<p>The course will start with a description of Internet components and then it will describe computer networks layers from the Application network and going down to the physical layer.</p> <p>Internet layers, namely; application, transport, network, and data link layers will then be described in detail by giving real-world examples and their protocols will extensively described. Application protocols such as HTTP, FTP, SMTP, DNS, POP3 will be covered in addition to the peer-to-peer architecture and applications. Then TCP and UDP will be covered. IPv4 as well as IPv6 will be described. Subnetting strategies such as fixed length subnetting and VLSM will be covered in addition to different routing algorithms such as OSPF, RIP, BGP</p>
<p>Course objectives</p>	<ol style="list-style-type: none"> 1) Students will learn the hardware and software components that make up the Internet in addition to the most up to dated applications. 2) Students will be able to specify the elements of edge and core networks and the difference among them. In addition, they will be able to describe different types of 3) access network and their technology. 4) Students will understand different Switching technologies from the network layer prospective. 5) Students will be able to explain different Applications protocols such as HTTP, FTP, SMTP, POP3, and DNS and their 'real-world' corresponding applications. 6) Students will be able to describe different Transport Layer protocols and understand the relation, necessity, and use of each one with different Internet applications. 7) Students will be able to do network subnetting whether it is fixed length 8) subnetting or VLSM. 9) Students will fully understand IPv4 and how it does work. 10) Students will be able to describe IPv6 11) Students will be able to configure routers with different routing algorithms.
<p>Student's obligation</p>	<p>Students take active role in their learning process during their study period at the university. They are accountable for their academic success through making their own choice and take actions that lead them toward their educations goals. Student responsibilities could be expressed by the following points:</p> <ol style="list-style-type: none"> 1- Attend and participate in classes and labs prepared and on time. You are responsible for what you miss- "I was absent" is not an excuse for not understanding the material or not being prepared for an assessment.

	<p>2- Demonstrate academic integrity and honesty. No matter how much stress you are under, it is expected that you will do your work with integrity and honesty. The consequences of violating the academic integrity are very serious and could lead to expulsion or suspension from the college.</p> <p>A- Plagiarism: trust your own ideas and conduct the work by yourself. Don't copy ideas or data without citing the source. It is not allowed to get someone do your work on your behalf.</p> <p>B- Cheating is not allowed: You are not allowed to copy answers from another student or ask another student to do your own work. Results' fabrication is not permitted too. Changing graded exams and submit them for a regrading is not allowed.</p> <p>C- Don't facilitate copying your answers, whether in an exam, project, or any sort of test to another student.</p> <p>3- Do the home works, practice problems, re-solve all the examples and problems that were given in the class, submit your assignments\exercise problems on time with great attention to quality of work and intellectual property right (avoiding plagiarism).</p> <p>4- Turn off your cell phone and put it away before class starts so you can focus on the class discussion and not cause a distraction for others.</p> <p>5- Communicate in a careful and respectful manner with your instructors, colleagues, and other members of the college.</p> <p>6- Respect diverse ideas and opinions. You will be exposed to a variety of viewpoints, values and opinions in the class that will differ from your own. All students in this class should feel comfortable expressing their viewpoints and concerns. You are an important part of creating an atmosphere that makes this possible.</p> <p>7- Dedicate sufficient time to conduct self-study for the college work.</p>				
<p>Required Learning Materials</p>	<p>You can expect your instructors to:</p> <ul style="list-style-type: none"> • Attend every class period and arrive to class on time. • Learning tools will be data shows, lecture hand-outs and ppt. presentations, whiteboard explanation. • Online tools such as the university Moodle for submitting the reports and communicating with students. • Come to class with a good attitude. 				
<p>Evaluation</p>	<p>Task</p>	<p>Weight (Marks)</p>	<p>Due Week</p>	<p>Relevant Learning Outcome</p>	
	<p>Paper Review</p>				
	<p>Assignments</p>	<p>Homework</p>			
		<p>Class Activity</p>		<p>continuous</p>	
		<p>Report</p>		<p>13</p>	
		<p>Seminar</p>	<p>30</p>		
		<p>Essay</p>			
		<p>Project Presentation</p>		<p>14,15</p>	

	Quiz	10	Expected any time	
	Lab.			
	Theory Midterm Practical Midterm	10	8	
	Final Exam(theory) Final Exam (Practical)	50	15	
	Total	100		
Course References:	1- Computer Networking a Top Down Approach (6 th Edition), 2012 James F. Kurose and Keith W. Ross			
Course topics (Theory)		Week	Learning Outcome	
Internet Description from service and nuts and bolt prospective		1,2	<p>Students will learn the necessary network principles related to IoT paradigm.</p> <p>Students will be able to specify the elements of edge and core networks and the difference among them. In addition, they will be able to describe different types of access network and their technology.</p>	
Access Networks and Physical Mediums Core Network with different switching techniques Delay, Loss, Throughput in Packet Switched Networks		3,4	<p>Students will be able to do subnetting with IP6, this will be a unique skills for them in the market when they apply for job apart from the importance of learning such knowledge.</p> <p>Students will be able to specify the QoS parameters such as delay with all its types (transmission, propagation, processing), throughput, bandwidth, enhancement of accessing servers using cost effective methods.</p>	

<p>Protocol Layers Description Network Security Principles of Network Applications The Web and HTTP FTP Electronic Mail in the Internet DNS</p>	5, 6, 7	<p>Be able to understand the concept of sensor-cloud including its background, sensor virtualization, and applications. Be able to discuss practical examples that support the shift of the sensing paradigm from WSNs to sensor-cloud.</p>
<p>Peer-to-Peer Applications Transport Layer Services UDP and TCP Forwarding and Routing at the Network Layer Virtual Circuits and Datagram Networks</p>	8, 9, 10	<p>Students will be able to understand the necessity for fog computing in the IoT environment.</p> <p>Students will be able to understand the fog computing architecture, layers, elements and features.</p> <p>Student will be able to specify different IoT application along with their challenges, features, and characteristics.</p>
<p>Detailed Description of what is inside a router</p>	11	<p>Student will understand the most important concept of IoT function, that is device to device or machine to machine communication in which machine communication and interact without any human interaction.</p>
<p>IP Addressing Routing Algorithms</p>	12,13	<p>Student will be able to understand the concept of VANET and autonomous vehicle, Tesla auto-pilot will be given as an example.</p> <p>Student will be able to differentiate between IIoT and Industry V.4.</p> <p>Student will be able specify the function of industry V.4 such as self-configuration, self-optimization, self-diagnosis</p>
<p>IoTs Cyber Security Virtual Networks</p>	14,15	<p>Student will be able to understand the benefits of SDN in IoT environment that will make networks more adaptable and flexible</p> <p>Student will understand that Software-defined Networking in IoT is an</p>

		architecture that easily abstracts many different layers of a network. Student will be able to describe aims of SDN aims to improve network control by enabling enterprises and service providers to respond quickly to changing business requirements.
Practical Topics	Week	Learning Outcome
Questions Example Design		
Extra notes:		
Signature		

