جامعـة الزيتونــة الأردنيــة
Al-Zaytoonah University of Jordan
كلية العلوم وتكنولوجيا المعلومات
Faculty of Science and Information Technology

Detailed Course Description - Course Plan Development and Updating Procedures/ Computer Science Department	QF01/0408-3.0E

Faculty	Faculty of Science and IT	Department	Computer Science
Course number	0122382	Course title	Analysis & Design Of Networks Systems
Number of credit hours	3	Pre-requisite/co-requisite	Wireless Computer Networks

Brief course description.

Analysis and design of network systems is the course which describes the analysis and design phases when developing a computer network. These phases include the data gathering process and collecting the system requirements, understanding the process of network architecture and determining the main functions of computer network and designing the network according to the previous phase. The course provide also, the traceability process between the phases of network development.

	Course goals and learning outcomes
Goal 1	Understanding the main concept of network analysis and design and the ability to use these concepts during the network development phases.
Learning outcomes	1.1. Cite the need for network analysis and design 1.2. Providing the basic knowledge of each phase of network analysis and design. 1.3. Be able to How to gather, define, and validate real requirements for network.
Goal 2	Understanding the needs for requirements analysis and their specification.
Learning outcomes	2.1. Ability for gathering and listing requirements, developing service metrics. 2.2. the students have knowledge for developing the performance requirements (delay, capacity, RMA requirements) 2.3. The students able to analyzing the network flows and determining the type of flow models and there characteristics.
Goal 3	Presenting and overview the network architecture components
Learning outcomes	3.1. Developing the main components(functions) of computer networks such as(addressing/routing, security, management and performance) 3.2 conducting the knowledge of routing and addressing fundamentals, identifying and classifying routing boundaries. 3.3. able to identify and evaluate the mechanisms for each network component and performing trade-offs.

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Goal 4	Presenting and overview the design principles and performing tractability and design metrics.
Learning outcomes	4.1. Ability to conduct the outcomes from analysis and architecture processes to a physical design for the network. 4.2. Developing the main steps of design (first order, second and third order product). And producing the network blueprint. 4.3. Ability to evaluate the success of design and using the proper metrics.
Textbook	1.- Networks analysis, architecture and design. 3ed Edition. Mccabe. James D. 2014 2.- System analysis and design ((Shelly Cashman Series) 11th Edition. Scott Tilley), Harry J. Rosenblatt 2016
Supplementary references	1.- computer networks : a systems approach. 2012. Larry L. Peterson and Bruce S. Davie 2.- System analysis and design in a changing world.7th edition . John W. Satzinger 2015. 3.- Top-Down Network Design (3rd Edition) Priscilla Oppenheimer.2010.

Course timeline				
Week	**Number of hours**	**Course topics**	**Pages (textbook)**	**Notes**
01	1 1 1	**Overview of analysis architecture and design process**. Process components, importance of network analysis,	Ref.1: 1-23	
02	1 1 1	Models for network analysis, architecture, and design, system components and network services. Performance characteristics (capacity, delay, RMA, and performance envelop).	Ref.1: 24-50	
03	1 1 1	**Requirements Analysis Concepts**: the need for requirements analysis (user, application and device requirements).	Ref.1: 61-82	
04	1 1 1	**Continue Requirements**: network, and other requirements. The requirement specifications and map.	Ref.1: 83-93	
05	1	**Requirements analysis process**: gathering and	Ref.1:	

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" عراقة وجودة"
"Tradition and Quality"

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	1 1	listing requirements, developing service metrics. Characterizing behavior (modeling and simulation, user and application behavior). developing RMA requirements (Reliability, Maintainability, Availability, thresholds and limits).	100-124	
06	1 1 1	**Continue Requirements** : developing delay requirements (end-to-end round robin trip delays and delay variation). Developing capacity requirements (estimating data rate), developing performance requirements.	Ref.1: 125-143.	
07	1 1 1	**Continue Requirements**: Environment-specific thresholds and limits, requirements for predictable and guaranteed performance, requirements mapping.	Ref.1:145-154	
08	1 1 1	**Flow Analysis**: flows (individual and composite flows, critical flows). Identifying and developing flows (focusing on a particular application, developing a profile, data source and sinks).	Ref.1: 162-179	
09	1 1 1	**Continue Flow Analysis**: flow models (peer-to-peer, client-server, Hierarchical client-server, distributed computing, flow prioritization, the flow specification (flowspec algorithm, capacity and service planning, example application of flow analysis)	Ref.1: 180-204	
10	1 1 1	**Network Architecture:** Architecture and design, component architectures (addressing/routing component arch., network management component arch. , performance component arch., optimizing component arch.)	Ref.1: 213-226	
11	1 1 1	**Addressing and routing Architecture:** addressing fundamental, routing fundamental, routing mechanism (establishing routing flows, identifying and classifying routing boundaries, manipulating routing flows).	Ref.3: 251-256, 269-273	
12	1 1 1	Addressing strategies (evaluating routing protocols, choosing and applying routing protocols)	Ref.1:278-287	
13	1 1 1	**Performance architecture:** developing goals for performance, performance mechanisms (quality of service, prioritizing, traffic management, scheduling and queuing, service level agreements, policies)		

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14	1 1 1	Architectural considerations (evaluation of performance mechanism. **Network Design:** design concepts, analogy to a building design, design products, input to the design, design process.	Ref.1:335-351	
15	1 1 1	Design traceability, design metrics	Ref.1:351-353, 386-395	
16	1 1 1			

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

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Office hours			