Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئــــة الوطنيــــة للتقويــم
والاعـتـمــاد الأكــاديـمــي

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئــــة الوطنيــــة للتقويــم
والاعـتـمــاد الأكـاديـمــــي

Course Specifications

Institution	Date of Report
Najran University	
College/Department : Faculty of Art and Science /Computer Science Department	

A. Course Identification and General Information

1. Course title and code: Title: Data Communication and Networks   Code:293CS-3 (٢٩٣عال-٣)
2. Credit hours : (3)
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Computer Science Program
4. Name of faculty member responsible for the course Dr. Ali Hadi Bokar
5. Level/year at which this course is offered: level 5 / Third Year
6. Pre-requisites for this course (if any) 201ENG-3 (Electric circuits and operating systems)
7. Co-requisites for this course (if any) Non
8. Location if not on main campus main campus
9. Mode of Instruction (mark all that apply)   a. Traditional classroom ☑ What percentage? 100%   b. Blended (traditional and online) ☐ What percentage? ☐   c. e-learning ☐ What percentage? ☐   d. Correspondence ☐ What percentage? ☐   f. Other ☐ What percentage? ☐ Comments: We still teach this course using traditional methods but there is a plan to transform all course into electronic format using E-learning

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقويـــم
والاعــتــمــاد الأكـــاديـــمـــي

B Objectives

1. What is the main purpose for this course?
 	
    a) Memorize the rules and the theoretical basis associated with data transmission and Computer Networks.
    b) Designing computer networks of various technologies, hardware and software.
    c) Define a solution for social issues associated with computer networks.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Data Communications overview. Network Criteria. Categories of Networks. Analog and Digital Signals. Transmission Impairments. Guided and Unguided Transmission Media. Circuit Switching, Packet-Switched Networks : Delay, Loss, and Throughput. Service Models (OSI and TCP/IP). Application Layer: Web and HTTP , File Transfer Protocol, Electronic Mail , DNS, Socket Programming. Transport Layer: Multiplexing and Demultiplexing , Connectionless Transport: UDP , Connection-Oriented Transport: TCP , TCP Congestion Control. Network Layer: The Internet Protocol (IP): Forwarding and Addressing in Internet. Routing protocols: Flooding, Shortest path, and link state routing. Broadcast and Multicast Routing , Congestion and Qos. Link Layer: Error-Detection and -Correction Techniques, Multiple Access Links and Protocols, Switched Local Area Networks.

1. Topics to be Covered		
List of Topics	**No. of Weeks**	**Contact Hours**
Data Communications: Components, Data Representation, Data Flow Network Criteria: Physical Structures, Categories of Networks Analog and Digital Signals: Periodic and Nonperiodic Signals Periodic Analog Signals: Sine Wave, Time And Frequency Domains, Composite Signals, Bandwidth. Digital Signals: Bit Rate, Digital Signal as Composite Analog Signal Transmission Impairments: Attenuation, Distortion, Noise Transmission Media: Guided and Unguided Media. Circuit Switching Packet-Switched Networks : Delay, Loss, and Throughput Protocol Layers and Their Service Models (OSI and TCP/IP)	2.5	5
Application Layer Principles of Network Applications The Web and HTTP File Transfer Protocol: FTP Electronic Mail in the Internet DNS—The Internet's Directory Service Peer-to-Peer Applications Socket Programming: Creating Network Applications	2.5	5

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

NCAAA

المملكـة العربيـة السعوديـة
الهيئــة الوطنيــة للتقويــم
والاعـتـمـاد الأكـاديـمـي

Transport Layer Introduction and Transport-Layer Services Multiplexing and Demultiplexing Connectionless Transport: UDP Principles of Reliable Data Transfer Connection-Oriented Transport: TCP Principles of Congestion Control TCP Congestion Control	3.5	6
Network Layer Introduction What's Inside a Router? The Internet Protocol (IP): Forwarding and Addressing in the Internet Routing Algorithms: Flooding, Shortest path, and link state routing protocols Broadcast and Multicast Routing Congestion and Qos	3.5	6
Link Layer: Introduction to the Link Layer Error-Detection and -Correction Techniques Multiple Access Links and Protocols Switched Local Area Networks Link Virtualization: A Network as a Link Layer Retrospective: A Day in the Life of a Web Page Request	3	6

1. Topics to be Covered in Lab		
List of Topics	**No. of Weeks**	**Contact Hours**

UTP cable crimbling
    a. Crossover
    b. Straight forward
    c. Showing ther usage (PC to PC , PC to Switch, …)
	1	3

DOS network Commands 1) Ipconfig / all / renew 2) Tracert (show how many router are there between sender and reciever) 3) Lookup command (change between server IP and Web site name) 4) ARP command (to determine the MAC number of devices)	2	6
Socket programming (3weeks) 1) TCP and UDP Client-server programs 2) Simple Web server	3	9
Windows workgroup and File sharing and permissions (2weeks) 1) Shared folders 2) Creating different workgroups in LAN network. 3) Creating passwords for windows users to access devices. 4) File and Folder Access privileges.	2	6
Mid Term Test	1	3

المملكــة العربيــة السعوديــة
الهيئــــة الوطنيــــة للتقويــم
والاعـتـمــاد الأكـاديـمــي

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

Routing using Cisco Packet Tracer (4weeks)
1) Design simple LAN networks:
    a. Star topology
    b. Bus topology
    c. Ring topology (Optional if time permits)
2) Design simple network using different LANs (internetworking LANs)
3) Use RIP and/or OSPF routing protocols in the above network
4) Virtual LANs
	5	15

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30		30			60
Credit	30		15			45

3. Additional private study/learning hours expected for students per week.

4 hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئــة الوطنيــة للتقويــم
والاعـتـمـاد الأكـاديـمــي

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Memorize the principles, concepts and knowledge necessary in the field of data communications and computer networks	Lecture Discussion	Achievement test
1.2	Recall sufficient theoretical background to continue the ongoing development of various techniques to Computer Networks	Lecture Discussion	Achievement test
1.3			
2.0	**Cognitive Skills**		
2.1	Design various types of computer networks, wired or wireless various physical components and software	Lecture Discussion Problem Solving Laboratory method	Achievement test
2.2	Analyze the results obtained experimentally and develop the appropriate solutions	Lecture Discussion Problem Solving Laboratory method	Achievement test
2.3			
3.0	**Interpersonal Skills & Responsibility**		
3.1	Assess contemporary issues related to computer networks facing society in various fields and propose appropriate solutions	Lecture Discussion Problem Solving Laboratory method	Achievement test
4.0	**Communication, Information Technology, Numerical**		
4.1			
5.0	**Psychomotor**		
5.1			

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئــة الوطنيــة للتقويـم
والاعـتـمـاد الأكـاديـمـي

Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested _**verbs not to use**_ when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.
Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Mid-term exam	8	20
2	Quizzes	During the semester	10
3	Mid-Tem Lab Assignments	10	10
4	Final Lab Assignment	15	10
5	Final Exam	At the end of semester	40
6	Attendance	During the semester	10

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئــــة الوطنيــــة للتقويــم
والاعــتــمــاد الأكــاديــمــــي

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

E. Learning Resources

1. List Required Textbooks James F. Kurose, Keith W. Ross , "Computer Networking A Top-Down approach", , sixth edition,
2. List Essential References Materials (Journals, Reports, etc.) • Behrouz A. Forouzan, "Data Communication And Networking", Fourth Edition • Andrew S. Tanenbaum, David J. Wetherall , "Computer Networks" Fifth Edition,
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)   • "Data and Computer Communication", eighth edition, by William Stallings.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) http://en.wikipedia.org/wiki/Computer_network
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms for 20-30 students with data show Laboratories 20-30 students with C++ software (Eclipse), Packet tracer simulator

2. Computing resources (AV, data show, Smart Board, software, etc.) Classrooms Should include data show and also laboratories
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) none

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئــة الوطنيــة للتقويــم
والاعـتـمــاد الأكـاديـمــي

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: ✓ Distribution of a questionnaire for students to know how to achieve the goals in the theoretical and practical side.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:
  ✓ Discussions with colleagues who specialize in teaching methods and means of learning.
  ✓ Self-evaluation of the performance of the teacher.
  ✓ Discussions with other colleagues who taught this course.

3 Processes for Improvement of Teaching
  ✓ Diagnose weaknesses and turn them into strengths.
  ✓ Discussions about the decision and methods of teaching
  ✓ Study the needs of the labor market of college graduates

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Faculty or Teaching Staff: _____Dr Ali Hadi Bokar _____

Signature: _____   **Date Report Completed: _____**

Received by: _____   **Dean/Department Head**

Signature: _____   **Date: _____**