



ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CS)**



Course Specifications

Institution: Al Yamamah University	Date of Report: Thursday 24 October 2013
College/Department: Computer and Information Systems	

A. Course Identification and General Information

1. Course title and code: CIS 341 Computer Networks			
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) Bachelor of Computing and Information Systems			
4. Name of faculty member responsible for the course Dr. Abid Ali Minhas			
5. Level/year at which this course is offered 3 rd Year			
6. Pre-requisites for this course (if any) CIS 212: Data Communications.			
7. Co-requisites for this course (if any) (No Co-requisites course that is no course which is going be delivered at the same time)			
8. Location if not on main campus Main Campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning (Via electronic media) (Typically through internet, LMS, Edugate, email)	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other (Reading Assignments)	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			



B Objectives

<p>1. What is the main purpose for this course? This course belongs to the concentration of 'Networking and Security Engineering'. This course gives comprehensive knowledge and skills about the latest Computer Networks and their applications. This subject covers the fundamental concepts of OSI/TCP/IP model and functioning of different layers.</p>
<p>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)</p> <ul style="list-style-type: none"> • Use of LMS(Learning Management System) that increases the use of IT for students • Refer students to related website

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

Students will learn the design, configuration and maintenance of LAN, and WAN utilizing layer 2 switches, and layer 3 routers. Ethernet technologies, including high-speed Ethernet, Metro Ethernet and ATM LAN emulation will be included. Concepts related to Layer 3, including IP address management and router operations and management along with associated Internet protocols, advanced routing technologies, BGP protocols, multi-area routing protocols, security protocols, IP multicasting protocols are covered. Students will be given an introduction to IPv6. Concepts related to Layer 4 (here the TCP and UDP protocols) will be studied in detail, Concepts related to Layer 5 including DNS and Email will also be taught.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Layer 1: The Physical Layer: Introduction to Networks, Types/ Topologies of Networks and their applications, communication Media, Modulation, Multiplexing	2	6
Layer 2: The Data Link Layer: bridging/switching techniques, Flow control, Error Detection and Correction Schemes	2	6
Layer 3: The Network Layer: routing operations	1	3
IP protocols, address management	1	3
IP Routing, Internet access and operations	2	6
Router update protocols – RIP and OSPF	1	3
Inter-area routing – BGP protocols	1	3
Secure routing and Quality-of-service routing	1	3
IP Multicasting	1	3
IPv6 and the future of IP networking	1	3
Layer 4: The Transport Layer: TCP, UDP	1	3



Layer 5: The Application Layer: DNS, Electronic Mail, The Web, Streaming Audio and Video, Content Delivery, Virtual Private Networks	1	3
Total	15	45



2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	-	-	-	-	45
Credit	3	-	-	-	-	3

3. Additional private study/learning hours expected for students per week.	6
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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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.



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge After successful completion of the course students will be able to		
1.1	describe the knowledge of design and description of layered architectures of computer networks.	<ul style="list-style-type: none"> • Lectures • Group discussions • Mini/ Group projects • Assignments/ Homework • Simulation • Lab based project 	<ul style="list-style-type: none"> • Written exams (quizzes, mid-term, and final exams) • Oral presentations • Group discussion • Assignments/ Homework • Lab based assignment
1.2	Recognize all possible algorithms present at each layer and applications of computer networks.		
2.0	Cognitive Skills After successful completion of the course students will be able to		
2.1	explain and apply the knowledge of design of computer networks for LAN, MAN and WAN	<ul style="list-style-type: none"> • Case Studies • Projects from industry and society • Assignments/ Homework • Group discussion 	<ul style="list-style-type: none"> • Oral Presentations • Written exams
2.2	write down different algorithms for different layers for different design requirements		
3.0	Interpersonal Skills & Responsibility After successful completion of the course students will be able to		
3.1	<i>to demonstrate their effective working in groups and exercise leadership when required</i>	<ul style="list-style-type: none"> • Group Projects • Group discussion • Activity 	<ul style="list-style-type: none"> • Oral Presentations • Continuous monitoring and observing
3.2	<i>to show responsible and professional relationships in their working environment by executing moral values</i>		
4.0	Communication, Information Technology, Numerical After successful completion of the course students will be able to		
4.1	<i>demonstrate the effective use of Information Technology both in communication and design and analysis of the design of computer networks.</i>	<ul style="list-style-type: none"> • Group discussion • Group Projects • Assignments • Use of IT and mathematical tools 	<ul style="list-style-type: none"> • Written exams (quizzes, mid-term, and final exams) • Oral presentations • Mini/Group projects • Doing Assignments/ Homework using IT tools • Lab assignments
4.2	<i>show numerical analysis of all design related to computer networks.</i>		
5.0	Psychomotor On successful completion of the program students will be able to		
5.1	<i>show their manipulation and experimentation skills effectively</i>	<ul style="list-style-type: none"> • Lab work • Demonstration • Activity 	<ul style="list-style-type: none"> • Observing lab activities and equipment handling
5.2			



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
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	Assignments/ lab work/ Projects	9,11, 13	10%
2	Presentations/ Effective Participation	4, 7, 11, 13	10%
3	Quizzes	4, 7, 11, 13	10%
4	Midterm Exam	8	20%
5	Comprehensive Final Exam	17	40%
6	Punctuality and Attendance		10%



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)

In addition to class lectures time, teacher is supposed to display his/ her advisory hours (8 hours per week) for the students outside his/ her office in order to have individual student consultations and academic advice.

E. Learning Resources

1. List Required Textbooks:

1. Andrew S. Tanenbaum, "Computer Networks", 5th Edition, 2011, Pearson International Edition, ISBN-10: 0132126958, ISBN-13: 978-0132126953.

2. List Essential References Materials (Journals, Reports, etc.)

1. Douglas E. Comer, "Internetworking with TCP/IP Volume One", 6th Edition, 2013, ISBN-10: 013608530X, ISBN-13: 978-0136085300
2. James F. Kurose, Keith W. Ross, "Computer Networking – A Top-Down Approach", Sixth Edition, 2012, ISBN-10: 0132856204, ISBN-13: 978-0132856201.
3. Behrouz Forouzan, Firouz Mosharraf, "Computer Networks – A Top-Down Approach", McGraw Hill Higher Education, 2011, ISBN-10: 0071315152, ISBN-13: 978-0071315159.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks, A Systems Approach" Fifth Edition:(The Morgan Kaufmann Series in Networking) (Mar 25, 2011)
2. Douglas E. Comer, "Computer Networks and Internets" Fifth Edition, 2008
3. William Stallings, "Data and Computer Communications", 9th Edition, 2010
4. Behrouz Forouzan, "TCP/IP Protocol Suite", McGraw-Hill, 2009.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- Internet RFC Standards: <http://www.rfc-editor.org/>
- Cisco CCNA Review Guides
<http://www.comptia.org/home.aspx> (IT industry for knowledge and Certifications)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Packet Tracer, a computer-based program is used to develop cognitive skills in the students.

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, ✓ Computer Laboratory ✓ Network Laboratory
2. Computing resources (AV, data show, Smart Board, software, etc.) ✓ Computer Laboratory ✓ data show ✓
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) ✓ Network Laboratory with Catalyst Switches and Routers

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching During the course, students receive a feedback forms that covers all aspects relating to their learning experience. These forms will then be collected and analyzed by the Academic Advising and Counseling Department. Next, the Academic Advising and Counseling Department will conduct a meeting with the concerned faculty to discuss the students' feedback outcomes.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor Peer review visits are normally conducted among faculties wherever possible during academic year. During the lecture time Chair (Head)/ Dean of the department visits the classroom. At the end of each visit, faculties are usually set together to discuss related issues.
3 Processes for Improvement of Teaching <ul style="list-style-type: none">• Feedbacks from students using different types of survey including Student Experience Survey (SES), Program Evaluation Survey (PES), and Alumni Survey (AS) are shown and discussed with faculty members to improve the teaching.• Specialized workshops and seminars are conducted throughout academic year to address specific teaching strategies and improvements.



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)

Peer review and discussion with course coordinator. There should be a strong liaison with teacher from some external university/institute in order to exchange ideas related to marking/ evaluating quizzes and assignments.



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

At the end of each semester, Curriculum committee conducts a meeting with all faculty members in which surveys filled by the students and other feedbacks from faculty members are discussed. Effectiveness of the courses, mistakes done and weaknesses are discussed. These points are made basis for the planning for improvements for next semester/ year.

Faculty or Teaching Staff: Dr.Abid Ali Minhas

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

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

Signature: _____ **Date:** _____