

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Operating Systems and Networks

14022202-3

Course Specification

Institution	Umm Al Qura University	Date of Report: 07-1437 / 04-2016
College/Department	College of Computers and Information Systems Information Systems Department	

A. Course Identification and General Information

1. Course title and code:	Operating Systems and Networks 14022202-3		
2. Credit hours	3 credits		
3. Program(s) in which the course is offered.	Information Systems, Bachelor of Science		
4. Name of faculty member responsible for the course	Dr Hassen Sallay		
5. Level/year at which this course is offered	2 th year after preparatory/ level 5		
6. Pre-requisites for this course (if any)	14021201-3 IT Skills		
7. Co-requisites for this course (if any)			
8. Location if not on main campus:	Delivered in the four locations where the Information Systems BSc is given:		
	<ul style="list-style-type: none"> - Al Abdiyya main campus boys section, - Al Zahir main campus girls section, - Al Qunfuda Boys section, - Al Qunfuda Girls section. 		
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	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B Objectives

1. What is the main purpose for this course?

This course introduces principles of operating systems and networking. The operating system manages hardware resources and provides a simplified interface for programs to use these resources. Networking allows different computers to communicate and potentially act as a larger virtual system. These topics are closely related; 50% of the module is on operating systems, and 50% is on computer networks. By the end of this course, student will understand the requirements and design of modern systems and networks, their operation and use by applications.

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)

1 Topics to be Covered		
List of Topics	No of Weeks	Contacthours
Introduction to operating systems and networking	1	3
System interfaces	1	3
Process management and concurrency	2	6
Inter Process Communication and deadlock detection	2	6
I/O, file systems and virtual memory	2	6
models of communication (ISO reference model)	2	6
network topologies	1	3
packet / circuit switching and routing algorithms	2	6
client-server systems and socket programming	1	3
Network services	2	6

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	32		32			64
Credit	60%		40%			3

3. Additional private study/learning hours expected for students per week.	3
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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		
1.1	Understand the main principles of processes and threads, inter-process communication, process synchronization, and algorithms for process scheduling	<ol style="list-style-type: none"> Lectures covering foundation concepts relating to the field of operating systems and network. Audio visual presentation including some scientific movies for specific topics in operating systems and network. Class sessions where issues relating to operating systems and network will be discussed and explored. Case study. The course will make effective use of case studies to further enhance the students understanding of presented concepts. Reading (Book Chapters, IETF Web Site). In-class tutorials which review the content of each lecture and elaborate on any matters not understood. Debriefing: Usually conducted at the conclusion of a lesson, debriefing allows students to condense and coalesce their knowledge and information as a group or whole class. Hands-on lab experiments to acquire practical skills. Projects/Presentation. 	<p>Short quizzes.</p> <p>Project and Oral presentations</p> <p>Written exams (midterm and final)</p>
1.2	Understand virtual memory abstractions in operating systems.		
1.3	Have an understanding of disk organization, file system structure and I/O management		
1.4	Understand computer networks, OSI model and Internet		
1.5	Ability to describe the network related topics and solve related problems		
1.6	Skills to develop network applications based on client-server architecture		
1.7	Ability to use new networking tools for engineering practices.		
2.0	Cognitive Skills		

2.1	Recognize the importance of operating systems and networking.	<ol style="list-style-type: none"> 1. Reading around the systems and network topics, including core materials, materials introduced via lectures and the module website, and any relevant magazine and journal articles; 2. Practical sessions will provide opportunities to explore issues relating to network and systems on the computer. 3. Hands-on labs where students have the opportunity to gain hands-on experience on course topics 	<p>Written exams (midterm and final).</p> <p>Reports and oral presentations.</p> <p>Lab projects and assignments</p> <p>Written exams/projects/ reports all require application of the techniques and concepts presented throughout the course.</p>
2.2	Understand modern operating systems and the strengths and weaknesses of the most popular ones.		
2.3	Explain the internal architecture of some network services, protocols and infrastructure		
2.4	Use network and systems tools and software.		
3.0	Interpersonal Skills & Responsibility		
3.1	Work harmoniously with others	<p>In-class discussions with the students.</p> <p>Group projects where the students are divided into small group and are assigned <i>small to medium sized</i> programming projects.</p> <p>Regular critique of performed tasks by team members</p> <ul style="list-style-type: none"> • Constructive feedback on both content and presentation • Recommended reading: Elements of Style <p>in-class oral presentation of each projects by its team</p>	<ul style="list-style-type: none"> • Project reports and/or documentation files are required in submitting any software. • Instructor personal observations. • student peer-to-peer assessments
3.2	Evaluate and accept responsibilities		
3.3	Identify methods to use to respond to conflict		
3.4	Work in teams more efficiently		
3.5	Ability to actively collaborate within teams		
3.6	Clearly communicate ideas and solutions of problems to others.		
3.7	Ability to write useful documentation/reports of software projects		
4.0	Communication, Information Technology, Numerical		
4.1	Use of the Network and systems tools and	1. Lab tutorials and hands-on	Homework and

	techniques		
4.2	Presentation skills	exercises to develop the skills needed for using the available tools. 2. Project 3. Survey Study 4. Presentation	assignments involving the use of the systems and network tools .
5.0	Psychomotor		
5.1	N/A		
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	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Quizzes/Homework	3, 6, 9, 12	5%
2	Survey Study	8	15.0%
2	Midterm exam	10	20%
3	Project	13	20%
4	Lab exam	15	20%
4	Final	16	40%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice.

- Each instructor is required to allocate at least four office hours per week for consultations and

<p>academic advice.</p> <ul style="list-style-type: none"> • TA is available for this programming course. • Each student is assigned an academic advisor to provide general consultation
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E Learning Resources

<p>1. Required Text(s)</p> <p>1. Operating System Concepts, A. Silberschatz Eight Edition, Wiley, ISBN-13: 978-0470128725</p> <p>2. Computer Networking: A Top-Down Approach", James Kurose and Keith Ross, 5th edition ISBN: 0136079679, Publisher: Addison-Wesley, 2009.</p>
<p>2. Essential References</p>
<p>3- Recommended Books and Reference Material (Journals, Reports, etc)</p>
<p>4-.Electronic Materials, Web Sites etc</p> <ul style="list-style-type: none"> • http://www.ietf.org • http://www.acm.org • http://ieeexplore.ieee.org
<p>5- Other learning material such as computer-based programs/CD, professional standards/regulations</p> <ul style="list-style-type: none"> • Network Programming

F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Lecture rooms, laboratories, etc.)</p> <p>Lecture room with:</p> <ul style="list-style-type: none"> * at least 30 seats * A data show projector connected to a PC preferably with Internet connection * sliding board <p>Network Lab (at least 30 seats)</p>
<p>2. Computing resources</p> <p>30 FreeBSD/Linux/Windows PCs</p>
<p>3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)</p>

A networking lab with various networking hardware such PCs, printer, projector, routers, switches, hubs and Ethernet cabling. Software such as Linux windows etc.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching End-of-term course/teacher evaluation for is to be completed by students at the end of the semester, evaluating the content of the course, its teaching, the learning, assessment methods.. The monitoring of these students feedback will allows the course quality improvement
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department <ul style="list-style-type: none">• Peer Evaluation Procedure• Instructor self-evaluation
3. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) <ul style="list-style-type: none">• Upon student request, his/her work might be remarked by another faculty member within the department.
4 Processes for Improvement of Teaching <ul style="list-style-type: none">• (Self , Peer) Review, Identify, Analyse, and Revise
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none">- Review and update course content- Update course references- Use students feedback

Faculty or Teaching Staff: _____

Signature: _____ Date Report Completed: _____

Received by: _____ Dean/Department Head: Dr. Skander Turki

Signature: _____ Date: 07-1437 / 04-2016