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National Commission for
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ATTACHMENT 2 (e)

Course Specifications

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Course Specification

Information Security Standards and Auditing 14024205-3

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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: **Information Security Standards and Auditing** **14024205-3**
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 **4th year after preparatory year / elective**
6. Pre-requisites for this course (if any) **14023203-3Information Systems Security**
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: - Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course?
This course provides an introduction to security management and auditing mainly based on the ISO 27000 family of standards. In addition to risk management methods, the course also presents both nominal security audit and technical security audit.
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	Contact hours
Information Security: an overview	2	6
Implementing ISMS : Challenges	2	6
Introduction to ISMS standards	2	6
ISMS ISO Standards family	2	6
Risk management Methods	2	6
Nominal security Auditing	2	6
Technical Security Auditing	2	6
Case Study	2	6

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	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	3 credits					3 credits

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

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

2

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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understand the information security management system (ISMS) process	**Conventional lectures:** The instructor introduces the important concepts of each topic via PowerPoint presentations. The lecture must also contain in-class interaction between the instructor and students and illustrative examples and realistic problems. Lectures can be recorded and put available for students to help them going back to lecture points at home and during revision.	**Quizzes** (e.g. online quizzes with Umm al Qura online learning system): this helps the students to make a quick revision of the fundamental concepts studied during formal lectures. They may be graded or not.
1.2	Learn ISMS standards		**Written exams** (midterm and final exams): Exams are the main assessment method to evaluate the understanding of students.
1.3	Learn risk management methods		
1.4	Understand the auditing process	**Hand-on Labs**: The instructor ensures some labs to students to help them understanding the practical issues of the course.	
1.5	Conduct a security audit for real small-size organization		**Practical project**: This is a project aiming to apply security standards to a real system under study. The student must follow a specific steps within a standard methodology to apply the standards and proceed auditing scenarios. He will use studied techniques and tools to achieve an entire ISMS auditing.
		Textbook reading assignment: this helps the students to get more advanced knowledge on the topics under study.	
		Class session exercises: Exercises for each topic will help students to learn how to resolve real problems and understand the main concepts.	
		Practical projects: practical projects will improve the knowledge of the student with respect to the use and exploitation of course related software and methodologies	**Assignments and homework**: the instructor should make assignments and homework to students for each lecture before going for a subsequent lecture.
2.0	**Cognitive Skills**		
2.1	Understand the difference between security standards.	- Conventional lectures to introduce important concepts through in-class discussions.	- Written exams (mid-term and final).
2.2	Understand the problems with the deployment of ISMS.	- In-class tutorials which review the content of each lecture and elaborate on any matters not understood.	- Quizzes. - Reading assignments from the textbook
2.3	Compare between various risk management methodologies.		
2.4	Develop an understanding of the	- Case Study: the student will have the	

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	concepts of ISMS process.	opportunity to apply ISMS standards on case study from scratch which will further deepen their understanding of the presented materials.	
2.5	Audit, validate and verify a real ISMS case.		
2.6	Develop an experience in ISMS standards deployment.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	The students must learn how to communicate with each other and how to collaborate to achieve a common task. This will prepare them for working as a group, which is important in any professional environment. They must also show ability to write useful documentation/reports of software projects.	**Group work of course projects:** The students will be asked to work as a group and this enables them to be responsible over the tasks they get assigned. In addition, they will learn how to collaborate together to achieve a common task.	The assessment of interpersonal skills can be assessed during oral presentations of the students in front of the instructor, when they shall explain how to group work has been carried out.
4.0	**Communication, Information Technology, Numerical**		
4.1	Use some of the available ISMS software and free open source auditing software	- In class exercises to develop the skills needed for using the available free tools such that Free ISO27k Toolkit	- Homework and assignments involving the use of the ISMS software
4.2	The student should know how to write and present ISMS reports	- Case study and Project - Presentation	- Term project presentations. The students should provide a final report that describes all the details of their project work and results interpretations.
5.0	**Psychomotor**		
5.1	N/A		

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

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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

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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	2	10%
2	Midterm Exam	6	20%
3	Case study Project	10	30%
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 academic advice.
- Each student is assigned an academic advisor to provide general consultation.
- A mailing list for the course can help the instructors to interact with the students.
- The emails of instructors must be available for students for possible contact in case of unavailability during office hours.

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E Learning Resources

1. Required Text(s)   Information Security Management: Concepts and Practice 1st edition, Bel Gacem Raggad, CRC Press, 2010.
2. Essential References   ISO/IEC 27001, Information security management systems — Requirements   ISO/IEC 27002, Code of practice for information security controls   ISO/IEC 27004, Information security management — Measurement   ISO/IEC 27005, Information security risk management   ISO/IEC 27007, Guidelines for information security management systems auditing   ISO/IEC TR 27008, Guidelines for auditors on information security controls
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc   • Course website: http://www.uqu.edu/ccis/ise/1402 411/
5- Other learning material such as computer-based programs/CD, professional standards/regulations   • http://www.iso27001security.com/

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)   Lecture room with at least 30 seats.   Optional but useful facilities include: • A data show projector connected to a PC preferably with Internet connection   • sliding board
2. Computing resources

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3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) s

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. In addition, the instructor should make a self-evaluation by proposing an evaluation form to the students that should filled and returned anonymously to provide a feedback to the positive and negatives points observed during the term.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department • 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) • Upon student request, his/her work might be remarked by another faculty member within the department. No regular procedure for verifying standards of student achievement is implemented yet.
4 Processes for Improvement of Teaching The instructor must analyse the feedback from the student he receive from the self-evaluation form and try to adapt the structure/content/organization of the course for better efficiency.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Analysis of student's feedback and identification of weaknesses in the course and in the program to improve them.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

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Course Specification

Ethical Hacking & Penetration Testing
14024207-3

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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: **Ethical Hacking & Penetration Testing 14024207-3**
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 **4th year after preparatory year/ elective**
6. Pre-requisites for this course (if any) **14023204-3Information Systems Security**
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: - Al Abidiyya 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 ☒ What percentage? 100% b. Blended (traditional and online) ☐ What percentage? c. e-learning ☐ What percentage? d. Correspondence ☐ What percentage? f. Other ☐ What percentage? Comments:

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B Objectives

1. What is the main purpose for this course?
This course provides a comprehensive grounding in the methodology, techniques and culture of ethical hacking and penetration testing. It reinforces theory by practice and demonstrates current techniques and tools in this field. . Topics ranging from how perimeter defenses work to scanning and attacking 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)

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Introduction to Ethical Hacking and penetration testing	2	4
Foot printing	2	4
Scanning	2	4
Enumeration	2	4
System Hacking	2	4
Penetration Testing	2	4
countermeasures and defensive systems	2	4
Legal Issues	2	4

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	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	32			32		64
Credit	75%			25%		3 credits

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

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

3

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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understand the tactics and tools used by ethical hackers and penetration testers	**Conventional lectures:** The instructor introduces the important concepts of each topic via PowerPoint presentations. The lecture must also contain in-class interaction between the instructor and students and illustrative examples and realistic problems. Lectures can be recorded and put available for students to help them going back to lecture points at home and during revision. **Hand-on Labs**: The instructor ensures some labs to students to help them understanding the practical issues of the course. **Textbook reading assignment**: this helps the students to get more advanced knowledge on the topics under study. **Class session exercises**: Exercises for each topic will help students to learn how to resolve real problems and understand the main concepts. **Practical projects on ethical hacking and pen-test**: practical projects on ethical hacking and penetration testing will improve the knowledge of the student with respect to the use and exploitation of related software and output results analysis.	**Quizzes** (e.g. online quizzes with Umm al Qura online learning system): this helps the students to make a quick revision of the fundamental concepts studied during formal lectures. They may be graded or not. **Written exams** (midterm and final exams): Exams are the main assessment method to evaluate the understanding of students. **Practical project**: This is a project based on ethical hacking and pen-testing of a system under study. The student must follow a specific steps within a methodology to proceed ethical hacking scenarios. He will use studied techniques and tools to achieve an entire penetration testing process. **Assignments and homework**: the instructor should make assignments and homework to students for each lecture before going for a subsequent lecture. **Lab exam**: the objective of the lab exam is to assess the ability of the student to achieve ethical hacking and penetration testing tasks correctly.
1.2	Learn current methodologies and techniques ethical hacking and pen testing area		
1.3	Learn how intruders escalate privileges and what steps can be taken to secure a system		
1.4	Plan and execute a penetration testing Scenarios by using a variety of hacking testing tools;		
1.5	Set up strong countermeasures and defensive systems to protect an organization's critical infrastructure and information		

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2.0	**Cognitive Skills**		
2.1	Understand the difference between the hacking and ethical hacking.	-Conventional lectures to introduce important concepts through in-class discussions. -In-class tutorials which review the content of each lecture and elaborate on any matters not understood. -Practice labs. The course will also utilize available hacking and pen-test software to further enhance the students understanding of the presented concepts. -Hands-on labs where the students will gain hands-on experience in essential course concepts thorough learning how to plan, execute and interpret ethical hacking and pen-testing scenarios in order to fortify security defence measures. The student will also have the opportunity to proceed an entire pen-test case from scratch which will further deepen their understanding of the presented materials.	Written exams (mid-term and final). Lab exams. Practical Projects. Quizzes. Reading assignments from the textbook Written exams/projects/ experiments all require application of the techniques and concepts presented throughout the course.
2.2	Understand the difference between the hacking vs penetration testing.		
2.3	Understand the problems with electronic hacking and their penalties in the law.		
2.4	Compare between various penetration testing methodologies.		
2.5	Develop an understanding of the concepts of penetration testing process.		
2.6	Validate and verify a real digital environment security case.		
2.7	Analyze and interpret data involved in the ethical hacking case.		
2.8	Develop a hands-on experience in some of the hacking and pen-testing software.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	The students must learn how to communicate with each other and how to collaborate to achieve a common task. This will prepare them for working as a group, which is important in any professional environment. They must also show ability to write useful documentation/reports of software projects.	**Group work of course projects:** The students will be asked to work as a group and this enables them to be responsible over the tasks they get assigned. In addition, they will learn how to collaborate together to achieve a common task.	The assessment of interpersonal skills can be assessed during oral presentations of the students in front of the instructor, when they shall explain how to group work has been carried out.
4.0	**Communication, Information Technology, Numerical**		
4.1	Use some of the available pen-testing software and free open source hacking software	- Lab tutorials and hands-on exercises to develop the skills needed for using the available tools. - Project - Presentation	Homework and assignments involving the use of the haking software Term project presentations. The students should provide a final report that describes all the details of their project work and
4.2	The student should have good programming skills.		
	The student should know how to present pen-testing results		

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			results interpretations.
5.0	**Psychomotor**		
5.1	N/A		

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

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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.

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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	2	15%
2	Midterm Exam	6	20%
3	Practical Project	10	25%
4	Final	Exam week (after 16th week)	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 academic advice.
- TA is available for this programming course.
- Each student is assigned an academic advisor to provide general consultation.
- A mailing list for the course can help the instructors to interact with the students.
- The emails of instructors must be available for students for possible contact in case of unavailability during office hours.

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E Learning Resources

1. Required Text(s) Patrick Engebretson, The Basics of Hacking and Penetration Testing, (Ethical Hacking and Penetration Testing Made Easy), Elsevier. August 1, 2013, ISBN-13: 978-0124116443 ISBN-10: 0124116442 Edition: 2nd
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc •   Course website: http://www.uqu.edu/ccis/ise/1402 573/
5- Other learning material such as computer-based programs/CD, professional standards/regulations •   https://pentest-tools.com/home

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Lecture room with at least 30 seats. Optional but useful facilities include: •   A data show projector connected to a PC preferably with Internet connection •   sliding board
2. Computing resources Linux/Windows lab with the necessary hacking software.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) s Lab with 30 PCs

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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. In addition, the instructor should make a self-evaluation by proposing an evaluation form to the students that should filled and returned anonymously to provide a feedback to the positive and negatives points observed during the term.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department • 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)   • Upon student request, his/her work might be remarked by another faculty member within the department. No regular procedure for verifying standards of student achievement is implemented yet.
4 Processes for Improvement of Teaching The instructor must analyse the feedback from the student he receive from the self-evaluation form and try to adapt the structure/content/organization of the course for better efficiency.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Analysis of student's feedback and identification of weaknesses in the course and in the program to improve them.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

e-Commerce Systems
14024107-3

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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:
e-Commerce Systems
14024107-3
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 Skander Turki
5. Level/year at which this course is offered
4th year after preparatory / elective
6. Pre-requisites for this course (if any)
14022401-3 Internet Technologies
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:
-   Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course? This course provides broad coverage of e-commerce systems. It covers the various e-commerce business models and e-commerce payment systems. Students will be exposed to e-commerce development technologies and frameworks.
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	Contact hours
Importance of E-commerce	2	4
Various case studies from Local Business	2	4
Requirement elicitation for e- commerce IS	3	6
Techniques for designing E-Commerce	3	6
Implementation of E-commerce system	2	4
Validating an E-commerce	2	4
Transition to use with stakeholders (business with whom work was carried)	2	4

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2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	32		32			64
Credit	70%		30%			3 credits

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

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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Identify the key components of e-commerce business models	Lectures Labs Project	Quizzes and/or Online Quizzes, Midterm, Lab Exam Final Exam Project evaluation
1.2	Describe the major business models		
1.3	Describe the features of e-commerce payment systems in use		
1.4	Describe the key dimensions of e-commerce security		
2.0	**Cognitive Skills**		
2.1	Explain key business concepts and strategies applicable to e-commerce	Project	Project evaluation
2.2	Build E-commerce applications	Project	Project evaluation
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work in teams efficiently	Team Project	Team Project evaluation
4.0	**Communication, Information Technology, Numerical**		
4.1	Ability to present a technical solution to a specialized audience.	Project presentation guidelines	Project presentation evaluation
5.0	**Psychomotor**		
5.1	N/A		

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

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

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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	Quiz	3, 6, 9,12	10%
2	Mid term	8	20%
3	Lab exam	16	10%
4	Project	15	20%
5	Final exam	Exam week	40%

D. Student Support

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

Office hours and meeting on projects

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E Learning Resources

1. Required Text(s) : slides and lab documentation *Laudon K., C. G. Traver, E-Commerce 2012, 8/E, ISBN-10:0136100570, ISBN-13:978-0136100577, Prentice Hall*
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Lecture room
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching   • Online –any time- feedback electronic form • End of term Feedback
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching   • Offering training sessions & Workshops • Providing specialized educational journals

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4. 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)

- External Examiners
- Marking an exam by a Group of faculty members; each marks a question of the exam for example.

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

- Study and analyse the feedback from students.
- Compare the learning outcomes with real students' results and skills they have gained.
- Review the course periodically by the curriculum committee to check with ACM requirements and top universities..
- Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Data Integration
14024404-3

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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:
Data Integration
14024404-3

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 Skander Turki

5. Level/year at which this course is offered
4th year after preparatory / elective

6. Pre-requisites for this course (if any)
14022401-3 Internet Technologies
14012301-3 Database 1

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:
- Al Abidiyya 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	X	What percentage?		100%
b. Blended (traditional and online)		What percentage?		
c. e-learning		What percentage?		
d. Correspondence		What percentage?		
f. Other		What percentage?		

Comments:

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B Objectives

1. What is the main purpose for this course?

- Basic concepts of data Integration
- How to resolve structural heterogeneity through schema matching and mapping
- How to query different heterogeneous data sources at once
- Translate data between databases with different data representations

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	Contact hours
Heterogeneity of data	1	2
Autonomous and distributed data sources	1	2
Structured vs. unstructured data	1	2
Preprocessing and Cleaning	3	6
Data Integration: Mediated schemata and query rewrite	2	4
Data Integration: Schema matching	2	4
Data Integration: Schema mappings	2	4
Data Exchange and transformations	4	8

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2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	32		32			64
Credit	80%		20%			3 credits

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

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.

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		NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0		**Knowledge**		
1.1		Given a description of a situation requiring data integration students will be able to classify it as belonging to one of a number of standard scenarios.	Lectures Problem sets	Quizzes and/or Online Quizzes, Midterm, Final Exam Lab exam
2.0		**Cognitive Skills**		
2.1		Ability to compare & evaluate different data integration solutions & justify the choice of one solution over another.	Lectures with case studies analysis	Quizzes and/or Online Quizzes, Midterm, Final Exam Lab exam
2.2		Given a description of a data integration & exchange scenario where access to data is restricted, students will be able to design a scheme to provide approximate results to queries taking account of restricted access.	Lectures with case studies analysis	
2.3		Given two database schemas students will be able to specify mappings between schemas & how to compose such mappings.	Lectures with case studies analysis	
2.4		Given a collection of databases, their schemas & mappings between schemas students will be able to describe how data is exchanged based on the schema mappings.	Lectures with case studies analysis	
2.5		Given a collection of databases, their schemas & schema mappings, students will be able to identify instances of inconsistent data.	Lectures with case studies analysis	
3.0		**Interpersonal Skills & Responsibility**		
3.1		N/A		
4.0		**Communication, Information Technology, Numerical**		
4.1		N/A		
5.0		**Psychomotor**		
5.1		N/A		

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
	estimate, explain, summarize, write, compare, contrast, diagram,

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Cognitive Skills	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

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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	Quiz	3, 6, 9,12, 15	20%
2	Mid term	8	20%
3	Lab exam	15	20%
4	Final exam	Exam week	40%

D. Student Support

1. Arrangements for availability of 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. Required Text(s) Doan, Halevy, and Ives. Principles of Data Integration, 1st Edition, Morgan Kaufmann, 2012

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2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Online –any time- feedback electronic form • End of term Feedback
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching • Offering training sessions & Workshops • Providing specialized educational journals
4. 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) • External Examiners • Marking an exam by a Group of faculty members; each marks a question of the exam for example.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Study and analyse the feedback from students. • Compare the learning outcomes with real students' results and skills they have gained. • Review the course periodically by the curriculum committee to check with ACM requirements and top universities.. • Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

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Course Specification

Data Mining
14024302-3

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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: **Data Mining** **14024302-3**
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 Mohamed Nour**
5. Level/year at which this course is offered **4th year after preparatory / Elective**
6. Pre-requisites for this course (if any) **14012301-3 Database I** **4042301-3 Intro Statistics & Probability**
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: - Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course?

The student will be able to use different data mining techniques to analyze and process data. In particular the course will cover, mining frequent data, cluster analysis, prediction and classification. The course will also cover mining data streams and the application of data mining in multimedia |

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	Contact hours
Introduction, basic concepts and motivation.	1	3
Data pre-processing: handling missing values, basic data transformations.	2	6
Rule induction; decision trees; naïve Bayesian probability; neural networks.	2	6
Advanced topic 1: image processing	2	6
Perceptron and support vector machines.	2	6
Ensemble methods: boosting, bagging & random forests.	2	6
Evaluation: cross validation, ROC.	2	6
Lazy learning: clustering and rule mining; association rule mining.	2	6
Time series.	1	3

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	100%					3 credits

3. Additional private study/learning hours expected for students per week.	2

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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them.	Lectures Problem sets	Quizzes and/or Online Quizzes, Midterm, Final Exam
1.2			
2.0	**Cognitive Skills**		
2.1	Evaluate models/algorithms with respect to their accuracy.	Lectures Problem sets Project	Quizzes and/or Online Quizzes, Midterm, Final Exam Project evaluation
2.2	Reflect on the results of a data mining exercise.		
2.3	Develop hypotheses based on the analysis of the results obtained and test them.		
2.4	Conceptualize a data mining solution to a practical problem.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate capacity to perform a self-directed piece of practical work that requires the application of data mining techniques.	Project	Project evaluation
4.0	**Communication, Information Technology, Numerical**		
4.1	N/A		
5.0	**Psychomotor**		
5.1	N/A		

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,

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	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

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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	Quiz	3, 6, 9,12, 15	20%
2	Mid term	8	20%
3	Project	15	20%
4	Final exam	Exam week	40%

D. Student Support

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

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E Learning Resources

1. Required Text(s) • Data Mining Concepts, Jan and Han 2nd edition
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) •   Han, J., Kamber, M., & Pei, J. Data mining: concepts and techniques. Morgan kaufmann.
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Online –any time- feedback electronic form • End of term Feedback
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching • Offering training sessions & Workshops • Providing specialized educational journals
4. 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) • External Examiners • Marking an exam by a Group of faculty members; each marks a question of the exam for example.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for

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improvement.

- Study and analyse the feedback from students.
- Compare the learning outcomes with real students' results and skills they have gained.
- Review the course periodically by the curriculum committee to check with ACM requirements and top universities..
- Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Enterprise Systems Development
14024403-3

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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:
Enterprise Systems Development
14024403-3
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. Skander Turki
5. Level/year at which this course is offered
4th year after preparatory / Elective
6. Pre-requisites for this course (if any)
14022401-3 Internet Technologies
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:
-    Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course? Improve the practice of software development, both individually and in groups, through the use of ``best practice'' programming design and development techniques Improve the practice of software development, both individually and in groups, through the use of code development tools. Create accurate and descriptive formal and informal models and use them to guide the development of and verification of software (code). Compare and contrast different software development process models in terms of their components, structure, and applicability. Be able to program at an intermediate level, understanding the language constructs, their correct use and limitations
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) Programming design and development tools evolve every year, the lecturer has to update the content of the course to reflect state-of-the-art design and development tools.

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	Contact hours
Designing a useful class hierarchy	1	5
Modular software design, interface specifications (cohesion/coupling)	1	5
Defensive programming	2	5
Design patterns	2	5
Version control system	1	5
Testing frameworks	2	5
Modeling tools (UML, state machines)	1	5
Debuggers	2	5
Tools for automation, scripting languages and build tools	1	5
Documentation Generators and Integrated Development Environments	1	5
Software Development Project	2	5

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2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	16		64			80
Credit	50%		50%			3 credits

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

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.

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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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understand advanced programming techniques and methodologies	Lectures team project labs	Quizzes and/or Online Quizzes, Team Project evaluation Midterm, Final Exam Lab exam
1.2	Understand software quality assurance methods and frameworks		
1.3	Understand collaborative work technologies		
1.4	Ability to identify and formulate engineering problems in the area of enterprise systems development		
2.0	**Cognitive Skills**		
2.1	Ability to design a software and implement it within version control and collaborative technological environments	Lectures team project labs	Quizzes and/or Online Quizzes, Team Project evaluation Midterm, Final Exam Lab exam
2.2	Ability to evaluate the quality of code through testing	Lectures team project labs	
3.0	**Interpersonal Skills & Responsibility**		
3.1	Ability to work in teams effectively	Labs Team Project	Team Project evaluation Lab exam
4.0	**Communication, Information Technology, Numerical**		
4.1	Ability to communicate effectively in written engineering report and in oral presentation	Project	Project presentation and report evaluation
5.0	**Psychomotor**		
5.1	N/A		

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

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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

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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	Quizes	3, 6, 9,12	10%
2	Mid term	8	20%
3	Lab exam	15	20%
4	Team project	16	30%
5	Final exam	Exam week	20%

D. Student Support

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

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E Learning Resources

1. Required Text(s) slides and lab documentation • Code Complete by Steve McConnell, 2nd ed., Microsoft Press
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) • UML Distilled by Martin Fowler, 3rd ed., Addison-Wesley Publishing. • Thinking in C++, 2nd ed, Vol 1 by Bruce Eckel, Vol 1, 2nd ed. Prentice Hall (free, on-line)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations Code Development Learning Websites like codeacademy.com

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)   Lab
2. Computing resources   Computers.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Online –any time- feedback electronic form • End of term Feedback

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2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

3 Processes for Improvement of Teaching
 	
   • Offering training sessions & Workshops
   • Providing specialized educational journals

4. 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)
 	
   • External Examiners
   • Marking an exam by a Group of faculty members; each marks a question of the exam for example.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
 	
   • Study and analyse the feedback from students.
   • Compare the learning outcomes with real students' results and skills they have gained.
   • Review the course periodically by the curriculum committee to check with ACM requirements and top universities..
   • Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Supply Chain and Logistics Fundamentals
14024501-3

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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:
Supply Chain and Logistics Fundamentals
14024501-3
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 Mohamed Nour
5. Level/year at which this course is offered
year 4 after preparatory / Elective
6. Pre-requisites for this course (if any)
14023102-4 Operations Research
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:
- Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course? This course surveys the fundamental analytic tools, approaches, and techniques used in the design and operation of logistics systems and integrated supply chains. More emphasis is put on where and how specific tools can be used to improve the overall performance and reduce the total cost of a supply chain. The three main topic areas covered are: Demand Forecasting, Inventory Management, and Transportation Planning. This is an analytical course that addresses real problems found in practice.
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) An adaptation can be done when reviewing the program.

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 per week
Introduction to logistics and supply chain management principles and theory	2	6
Introduction to strategies related to logistics and supply chain e.g., supply chain strategies, customer service strategies,	2	6
Identifying factors that influence the design of logistics and supply chains for businesses e.g., local and extended supply chains	2	6
Understanding the different stakeholders and their roles in logistics and supply chains e.g., suppliers, customers	2	6
Exploring different types of supply chains and associated activities affecting businesses e.g., goods, services, lean, agile	2	6
Identifying the relevant logistics and supply chain activities relating to a sample of industry sectors e.g., retail, manufacturing, services supply chains	2	6
Understanding factors that cause (potential) disruptions in logistics and supply chain activities e.g., risk, vulnerability, disasters	2	6
Introduction to environmental and social factors impacting logistics and supply chains e.g., green, Corporate Social Responsibility (CSR), sustainability	2	6

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	3 credits					credits

---

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

2

---

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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Demonstrate knowledge of the functions of logistics and supply chain management.	Lectures Team Problem sets (group case study analysis)	Quizzes and/or Online Quizzes, Midterm, Final Exam
1.2	Explain the sequential nature of logistics and supply chain management.		
2.0	**Cognitive Skills**		
2.1	Apply concepts and activities of the supply chain to actual organizations.	Lectures Team Problem sets (group case study analysis)	Quizzes and/or Online Quizzes, Team Problem sets evaluation Midterm, Final Exam
2.2	Produce examples of effective supply chain management and logistics implementation.		
2.3	Assess the effectiveness of logistics and materials management throughout the global supply chain.		
2.4	Examine the elements leading to effective partnering and strategic sourcing relationships		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Develop and apply effective interpersonal skills in working as a team to solve real-world problems in supply chain management	Team Problem sets (group case study analysis)	Team Problem sets evaluation
3.2	Develop appropriate leadership and organizing abilities in leveraging resources, capabilities, and competencies of a group to critically analyse situations and develop solutions to problems	Team Problem sets (group case study analysis)	Team Problem sets evaluation
4.0	**Communication, Information Technology, Numerical**		
4.1	Develop and apply effective communication techniques in working as a team to solve real-world problems in supply chain management	Team Problem sets (group case study analysis)	Team Problem sets evaluation
5.0	**Psychomotor**		
5.1	N/A		

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
	estimate, explain, summarize, write, compare, contrast, diagram,

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Cognitive Skills	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

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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	Quiz	3, 6, 9,12	10%
2	Mid term	8	20%
3	Problem sets evaluation (two in total, more if the number of students is below 15 in each class)	7, 15	30%
4	Final exam	Exam week	40%

D. Student Support

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

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E Learning Resources

1. Required Text(s) :   Simchi-Levi, David, Xin Chen, and Julien Bramel. *The Logic of Logistics: Theory, Algorithms, and Applications for Logistics and Supply Chain Management*. 2nd ed. New York, NY: Springer, 2004. ISBN: 9780387221991.
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)   Lemm, Jeffery M. *Handbook in Operations Research and Management Science. Vol. 4, Logistics of Production and Inventory*. Edited by S. C. Graves, A. H. G. Rinnooy Kan, and P. H. Zipkin. Amsterdam, Netherlands: North Holland Publishing, 1993. ISBN: 9780444874726
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations   Most lab on computer systems

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)   Lecture room
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching   • Online –any time- feedback electronic form   • End of term Feedback

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2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching • Offering training sessions & Workshops • Providing specialized educational journals
4. 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) • External Examiners • Marking an exam by a Group of faculty members; each marks a question of the exam for example.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Study and analyse the feedback from students. • Compare the learning outcomes with real students' results and skills they have gained. • Review the course periodically by the curriculum committee to check with ACM requirements and top universities.. • Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Advanced Topics in Databases
14024303-3

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:
Advanced Topics in Databases
14024303-3
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 Skander Turki
5. Level/year at which this course is offered
4th year after preparatory / elective
6. Pre-requisites for this course (if any)
14012301-3 Database 1
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:
- Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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B Objectives

1. What is the main purpose for this course? Advanced topics in databases are to be chosen according to new trends in the industry. Topics like **non-relational databases**, **NoSQL**, **NewSQL** or **graph databases** can be selected. Hands-on labs are given special attention in order to give students practical competencies in the field.
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
N/A	16	48

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2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	3 credits					3 credits

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

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.

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		NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0		**Knowledge**		
1.1		Ability to identify and formulate engineering problems in the area of data engineering	Lectures Problem sets	Quizzes and/or Online Quizzes, Midterm, Final Exam Project
2.0		**Cognitive Skills**		
2.1		Ability to design a system, component or process with defined constraints	Lectures Problem sets	Quizzes and/or Online Quizzes, Midterm, Final Exam Project
2.2		Ability to solve engineering problems and implement designed solutions	Lectures Problem sets	
2.3		Ability to collect and analyze data, and draw conclusions through experiments while testing a project.	Lectures Problem sets	
2.4		Ability to conduct enough literature review in the project domain	Lectures Problem sets	
3.0		**Interpersonal Skills & Responsibility**		
3.1		N/A		
3.2				
4.0		**Communication, Information Technology, Numerical**		
4.1		N/A		
4.2				
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

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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

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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	Quiz	3, 6, 9,12, 15	20%
2	Mid term	8	20%
3	Project	15	20%
4	Final exam	Exam week	40%

D. Student Support

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

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E Learning Resources

1. Required Text(s)
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Online –any time- feedback electronic form • End of term Feedback
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching • Offering training sessions & Workshops • Providing specialized educational journals
4. 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) • External Examiners • Marking an exam by a Group of faculty members; each marks a question of the exam for example.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

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- Study and analyse the feedback from students.
- Compare the learning outcomes with real students' results and skills they have gained.
- Review the course periodically by the curriculum committee to check with ACM requirements and top universities..
- Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

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

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

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

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ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Selected Topics in Information Systems Engineering 14024106-3

Kingdom of Saudi Arabia
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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: **Selected Topics in Information Systems Engineering**   **14024106-3**
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   **4th year after preparatory / Elective**
6. Pre-requisites for this course (if any)   **14021101-3 Introduction to IS**   **14012301-3 Database I**
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:
   - Al Abidiyya 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	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقويــم
والاعــتــمــاد الأكـاديـمـــي

B Objectives

1. What is the main purpose for this course? Selected topics in information systems engineering are to be chosen according to new trends in the industry. Candidate topics may include but not limited to: - **Data recovery and continuing operations**: refers to the processes, plans, and technologies required for an enterprise to achieve resiliency given unexpected events that may disrupt IT operations. This course provides an overview of the storage technologies to address backup, disaster recovery, and business continuity. Technologies that address auditing, redundancy, and resiliency in the infrastructure (e.g., networks, power, cooling, etc.) are described. Beyond the technologies, processes and plans for continuing operations are covered to include issues such as business continuity, disaster recovery, and risk management. - **Privacy Engineering**: Personal information has become a new class of digital property with immense value in commerce but also critical to the effectiveness of national security and intelligence. Virtually any information system must be engineered to comply with increasingly complex public laws protecting privacy while also preserving the information's value to business, national security, and law enforcement. This course dismantles the various sources of domestic and international rules.
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
N/A	16	48

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	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	100%					3 credits

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

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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.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Ability to identify and formulate engineering problems in the area of IS engineering	Lectures covering foundation concepts relating to the field of ISE	Short quizzes.
1.2	Ability to function in multidisciplinary teams	Audio visual presentation including some scientific movies for specific topics in ISE	Project and Oral presentations
1.3	Ability to conduct enough literature review in the project domain	Class sessions where issues relating to ISE will be discussed and explored.	Written exams (midterm and final)
1.4	Ability to design a system, component or process with defined constraints	Case study. The course will make effective use of case studies to further enhance the students understanding of presented concepts.	
1.5	Ability to solve engineering problems and implement designed solutions	Reading (Research Papers, Book Chapters, IETF Web Site).	
1.6	Ability to collect and analyze data, and draw conclusions through experiments while testing a project.	In-class tutorials which review the content of each lecture and elaborate on any matters not understood.	
1.7	Ability to communicate effectively in written engineering report and in oral presentation	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. Projects/Presentation.	
2.0	**Cognitive Skills**		
2.1	Prepare a survey study on a given ISE hot topic	Reading around the ISE topics, including core materials, materials introduced via lectures and the module website, and any relevant magazine and journal articles;	Written exams (midterm and final). Reports and oral presentations.
2.2	Understand modern ISE methods and approaches as well as the strengths and weaknesses of the most popular ones.	Practical sessions will provide opportunities to explore issues relating to ISE on the computer.	Written exams/projects/ reports all require application of the techniques and
2.3	Explain the internal architecture of some IS infrastructure	Students will be asked to give a short lecture, or to present the results of a recent publication	concepts presented throughout the

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		to the class.		course.
3.0	**Interpersonal Skills & Responsibility**			
3.1	Work harmoniously with others	In-class discussions with the students. Group projects where the students are divided into small group and are assigned *small to medium sized* programming projects. Regular critique of performed tasks by team members - Constructive feedback on both content and presentation - Recommended reading: Elements of Style in-class oral presentation of each projects by its team		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 course topics related tools and techniques	Project Survey Study Presentation		Homework and assignments
4.2	Presentation skills			
5.0	**Psychomotor**			
5.1	N/A			

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

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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		5%
2	Survey Study	8	15.0%
2	Midterm exam	10	20%
3	Project	13	20%
4	Final	Exams Week	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 academic advice.   • Each student is assigned an academic advisor to provide general consultation

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E Learning Resources

1. Required Text(s)   1.
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Lecture room with: * at least 30 seats * A data show projector connected to a PC preferably with Internet connection * sliding board
2. Computing resources 30 FreeBSD/Linux/Windows PCs
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

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 • Peer Evaluation Procedure • Instructor self-evaluation

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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)

- Upon student request, his/her work might be remarked by another faculty member within the department.

4 Processes for Improvement of Teaching
- (Self , Peer) Review, Identify, Analyse, and Revise

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