



ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)



هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: Al Yamamah University	Date: 6 th November 2018
College/Department : College of Business Administration/Department of Management	

A. Course Identification and General Information

1. Course title and code: Design of Experiments MGT 415																				
2. Credit hours: 3																				
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Bachelor of Business Administration																				
4. Name of faculty member responsible for the course: <u>Hanan K. Qatawneh</u> & <u>G.S. Vijaya</u>																				
5. Level/year at which this course is offered: Senior/4th Year																				
6. Pre-requisites for this course (if any): MGT 301, MGT401, STT202																				
7. Co-requisites for this course (if any): None																				
8. Location if not on main campus:																				
9. Mode of Instruction (mark all that apply): <table><tr><td>a. traditional classroom</td><td><input checked="" type="checkbox"/></td><td>What percentage?</td><td><input type="text" value="100"/></td></tr><tr><td>b. blended (traditional and online)</td><td><input type="checkbox"/></td><td>What percentage?</td><td><input type="text"/></td></tr><tr><td>c. e-learning</td><td><input type="checkbox"/></td><td>What percentage?</td><td><input type="text"/></td></tr><tr><td>d. correspondence</td><td><input type="checkbox"/></td><td>What percentage?</td><td><input type="text"/></td></tr><tr><td>f. other</td><td><input type="checkbox"/></td><td>What percentage?</td><td><input type="text"/></td></tr></table> Comments:	a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100"/>	b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>	c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>	d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>	f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
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B Objectives

1. What is the main purpose for this course?

COURSE DESCRIPTION

Design of experiments, which has been widely applied in the disciplines of science, engineering, and manufacturing, needs to be applied in the discipline of management. It is one of the most important tools of scientific knowledge development. Students who would be leaders in management needs to learn this important method of knowledge development. This course requires basic knowledge of statistics.

After the completion of the semester, students would be able to

- Describe how designed experiments can help to identify significant variables or treatments affecting quality of services and products.
- Know how to determine the levels of treatments that would result in the best quality of service and products.
- Know how to analyze statistical data of designed experiments.
- Explain how to interpret results of statistical analyses of designed experiments.
- Describe the best combinations of treatments for the best quality.

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)

- Periodically, in every two years, review the entire course content and develop the course as per the need and requirement of the environment.

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

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction of Design of Experiment, Motivation why Design of Experiment	1	3
Scientific methods and Design of Experiment. Comparative experiments and application examples	1	3
Review of qualitative and quantitative statistical techniques and analyze numerical data using summary statistics measures	1	3
Review of hypothesis testing techniques for one sample testing, and effectively communicate the results of a statistical test and select the appropriate sample size for a test	1	3
Review of hypothesis testing techniques for two sample testing, and effectively communicate the results of a statistical test	1	3
Learn why measurement is a process and discuss six important measurement characteristics.	1	3
Learn and analyze Gage R&R data on Minitab and learn how to identify sources of variation in the measurement process	1	3

Learn how to compare the means and variances of different treatments (groups) and also learn the basics of the analysis of variance (ANOVA)	1	3
Learn how to compare the means and variances of different treatments (groups) using general linear model (GLM). Learn how to analyze variation graphically using a multi-variate chart	1	3
Learn some of the fundamental DOE concepts such as randomization, replication, standard order, random order, main effects, interactions, curvature response surface, etc.	1	3
Learn how to design, conduct, and analyze a full factorial experiment and learn how to interpret various main effects and interaction plots	1	3
Learn how to design, conduct, and analyze a partial / fractional factorial design and learn how to interpret various main effects and interaction plots	1	3
Apply the following concepts to two-level factorials: blocking, confounding, resolution and projective properties	1	3
Develop the ability to analyze supposedly similar product/process areas to identify large sources of variation using two level fractional factorial designs. Develop the ability to analyze a fully nested design	1	3
Group Project Presentations	1	3

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planned	45	0	0	0	0	45
	Actual						
Credit	Planned	3	0	0	0	0	3
	Actual						

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

3 hours

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

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. (Courses are not required to include learning outcomes from each domain.)			
Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
	<p>1.1 Describe the role of Design of Experiments in planning and managerial decision making.</p> <p>1.2 Describe the various Design of Experiments concepts. Such concepts include (but are not limited to) Comparative experiments, qualitative statistical techniques, hypothesis testing for one sample and two samples, measurement, R & R data, Analysis of Variance, full and partial fractional design.</p>	<ul style="list-style-type: none"> Lectures, assignment and Group discussion 	<ul style="list-style-type: none"> Quizzes, Midterms, Final exam and Project report
2.0	Cognitive Skills		
	<p>2.1 The ability to analyse and interpret business situation and its problems in terms of available information.</p> <p>2.2 The ability to explain conceptual understanding of knowledge, theories, models and procedures to solve a range of business situations and problems.</p>	<p>Various methods will be applied like:</p> <ul style="list-style-type: none"> Giving assignment where students need to apply skills to solve the problems mentioned in the assignment. Arranging tutorials that includes discussion of issues and problems where analytical skills are needed to solve it. Conducting in-class assignments including some open ended problem solving tasks where 	<ul style="list-style-type: none"> Each test given during semester to include at least one item requiring students to apply formulae or conceptual insight in solution of a new problem. End of semester test in each course to include items requiring students to identify and use appropriate analytical tools for a new problem.

		students need to select appropriate methods or solutions.	
3.0	Interpersonal Skills & Responsibility		
	<p>3.1 Demonstrate the ability to work effectively in groups and exercise leadership when appropriate.</p> <p>3.2 illustrate the ability to act responsibly in personal and professional relationships with high moral and ethical standards.</p>	<ul style="list-style-type: none"> ▪ Each course includes at least one group project, case discussion in group and continuous assessment / discussion of class assignments. ▪ Assessments include evaluation of standard of report by group and individual performance rating on contribution made. 	<ul style="list-style-type: none"> ▪ Assessment of group and individual assignments / project within each course.
4.0	Communication, Information Technology, Numerical		
	<p>4.1 Demonstrate the ability to communicate effectively in oral and written forms.</p> <p>4.2 Demonstrate the ability to use information and communications technology, and use basic mathematical and statistical techniques.</p>	<ul style="list-style-type: none"> ▪ Students will go through eight levels of English proficiency courses during orientation year to learn basic communication skills in English. ▪ There is computer course and one math course during the orientation year where students learn the basic skills of handling computers and the basic of mathematics. ▪ The Introduction of statistics course during the first year of the academic program enables 	Direct assessment of basic skills including communications skills in English Language and use of IT through Project assessment.

		<p>students to learn various statistical tools and techniques.</p> <ul style="list-style-type: none"> Some courses in each year include required use of ICT for analysis and reporting, with quality of usage forming part of assessment. Assignments include required use of search engines on the internet. 	
5.0	<p>Psychomotor Not applicable for this course</p>		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Quizzes	Through the term	20
2	Midterm	Week 8	20
3	Group Project	Week 14	10
4	Final Test	Week 16	40
5	Assignments	Through the term	10

D. Student Academic Counseling and Support

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

- In addition to class lectures time, faculty members assign minimum two hours per week for student consultations and academic advice. The consultation time is mentioned in the Faculty Time Table and is display on the faculty member's office door.
- During the registration period, faculty members also spend time for review and approving students' registration form. Each faculty member is assigned a group of students for advising. The list is posted in the faculty office and students are advised to visit the faculty member during the time mentioned in his/her faculty time table.

E Learning Resources

1. List Required Textbooks

1. DOE Simplified: Practical Tools for Effective Experimentation, 2nd Edition by Mark J. Anderson & Patrick J. Whitcomb, 2007.
2. Testing 1 - 2 - 3: Experimental Design with Applications in Marketing and Service Operations (Stanford Business Books), 2007.

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

1. Montgomery, Design and Analysis of Experiments, 8th ed. Wiley 2012
2. Hicks and Turner, Fundamental Concepts in the Design of Experiments, 5th ed. Thompson
3. Berenson, Levine and Krehbiel, "Basic Business Statistics concepts and applications", 12th ed. Prentice- Hall 2012.
4. Design and Analysis: A Researcher's Handbook, 4/E, JohannesLedolter Arthur Swersey.
5. Handouts for special topics

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

LMS Portal

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
- College library contains all required references including additional materials that support the course content.
 - Digital libraries on the University online library includes many journals, eBooks and periodicals are available for students.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
- A classroom with 40 seating capacity is required.

2. Technology resources (AV, data show, Smart Board, software, etc.)
- Classroom should be equipped with multimedia projector and Internet access.

3. Other resources (specify, e.g. 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

- During week 13 and 14, the YU's "Student Affairs" department conducts a survey covering all aspects relating to their learning experience for the concerned course. Students are given questionnaire on different areas of the course including the effectiveness of the course.
- There are two ways that the survey is undertaken: manually by distributing the printed forms to the students during the class meeting hours and by electronically, where students are required to go to the computer lab for participating in the survey.
- The responses are forwarded to the "Information Center" where it is analysed and reports are prepared.
- The report is called "Course Evaluation Survey" or CES and is submitted to the department chairman, who shares the report with the respective faculty members.

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

- *Staff Submit course report at the end of each semester.*
- *Classroom observations are conducted by the Department chairman during class periods, especially for the newly recruited faculty members.*

- *A form with some standard questions regarding classroom activities is used to evaluate the performance of the faculty members during the classroom visits.*
- *Faculty members are informed about the classroom visits without notifying a specific day for the visit.*
- *The reports are shared with the faculty members.*

3. Processes for Improvement of Teaching

The process for improving the teaching includes the following:

- Workshops and seminars are conducted throughout academic year to address specific teaching strategies and improvements.
- Feedbacks from students using different types of survey are shown and discussed with faculty members to improve the teaching.

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

The University periodically uses collaborative faculty reviews to ascertain standards of student achievement.

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

The College Board periodically calls for the review of courses in the various disciplines to ensure they are current and applicable, especially for the periodic reports and evaluations to the MOE.

Name of Course Instructor: _____ Quality Faculty Team _____

Signature: _____ Date Specification completed: 6th November 2018

Program Coordinator: _____

Signature: _____ Date Received: _____