

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Research Methodology in CS

Course Code: 14016473-3

Date: 2018 –10 – 21.

Institution: Umm Al-Qura University

College: College of Computer and Information Systems Department: Department of Computer Science

A. Course Identification and General Information

1. Course title and code: Research Methodology in CS 14016473-3

2. Credit hours: 3

3. Program(s) in which the course is offered. Master of Computer Science (Artificial Intelligence)
(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course Dr. Murtaza Ali Khan

5. Level/year at which this course is offered: 1

6. Pre-requisites for this course (if any):

7. Co-requisites for this course (if any):

8. Location if not on main campus:

9. Mode of Instruction (mark all that apply):

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|-------------------------------------|----------------------|-------------|----------------------------------|
| a. Traditional classroom | <input type="text"/> | percentage? | <input type="text" value="100"/> |
| b. Blended (traditional and online) | <input type="text"/> | percentage? | <input type="text"/> |
| c. E-learning | <input type="text"/> | percentage? | <input type="text"/> |
| d. Correspondence | <input type="text"/> | percentage? | <input type="text"/> |
| f. Other | <input type="text"/> | percentage? | <input type="text"/> |

Comments:

B Objectives

1. The main objective of this course

This course provides a graduate-level study of research methodologies in computer science particularly artificial intelligence.

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

The course will teach state of the art theoretical and practical knowledge of research methodologies used in computer science particularly in artificial intelligence. Students will be assigned assignments and project to implement the research methods techniques to get hands on experience. At the end of the course, a seminar/presentation event will take place in which students will present their work.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

Course Description:

In this course, we will study research methodologies used in computer science, particularly in artificial intelligence (AI). The course introduces students to contemporary perspectives in CS/AI research and focuses on developing a range of skills involved in formulating a research proposal; including framing research questions, reviewing the literature and choosing appropriate methodologies for different types of study. The course will cover topics such as experiment design, simulations, statistics, analysis of data, etc. Students will learn various aspects of reading, writing, evaluating papers, and presenting research. There will be assignments during the semester allowing the students to practice different research skills and methodologies covered in the lectures. There will be a semester-long project in which students select, design, and execute research project and present the result at the end of the semester.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Data collection techniques (survey, experiment, questionnaire, etc.)	1	3
Framing research questions and choosing appropriate methodologies	1	3
Experiment design	1	3
Simulation and statistical analysis of data	2	6
Graphs and visualization of data	2	6
Ethics of research	1	3
Accessing research material	1	3
Review literature	1	3
Writing research papers	2	6
Peer review	1	3
Presenting research work	1	3

2. Course components (total contact and credit hours per semester):							
		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	42					42
	Actual	42					42
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week.	9-12
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

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 targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Understand the fundamental of Research Methods	Lecture, Group discussion	Exams, HWs, Quizzes
1.2	Ability to apply knowledge of Research Methods in publications, review and presentation	Lecture, Group discussion	Exam, HWs, Quizzes
2.0	Cognitive Skills		
2.1	Apply conceptual understanding of Research Methods	Lecture, Project	Exam, HWs
2.3	Ability to understand publication process used in academic community	Lecture, Project	Project Report, Project presentation
3.0	Interpersonal Skills & Responsibility		
3.1	Demonstrate own learning and professional development	Group discussion, Project	Project Report, Project presentation
3.2	Work effectively in groups to accomplish a common goal and show leadership qualities	Group discussion, Project	Project Report, Project presentation

3.3	Act ethically and responsibly with high moral standards	Lectures, discussion	Anti-plagiarism software, paper review, presentation
4.0	Communication, Information Technology, Numerical		
4.1	Ability to communicate clearly in oral and written form with range of audiences	Project	Project Report, Project presentation
4.2	Use of computing tools used in research	Lecture, Project	Project Report, Project presentation
4.3	Demonstrate the ability to use mathematical and statistical techniques in research methods	Lecture, Case studies, Project	Exams, Project Report, Project presentation
5.0	Psychomotor (if any)		

5. Assessment Task Schedule 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	HW 1	2	5%
2	HW 2	3	5%
3	HW 3	5	5%
4	HW 4	6	5%
5	Midterm Exam	8	20%
6	Writing Research Paper	10	40%
7	Presentation	15	20%

D. Student Academic Counseling and Support

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| <p>1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)</p> <ul style="list-style-type: none">i. Office Hours for student counseling and support – Three hours/weekii. Availability of teaching Staff on e-learning resources like uqu20/Piazza |
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E Learning Resources

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| <p>1. List Required Textbooks</p> <ul style="list-style-type: none">i. John W. Creswell and J. David Creswell. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications, latest edition.ii. Nigel G. Fielding (Editor), Raymond M. Lee (Editor), Grant Blank (Editor). The SAGE Handbook of Online Research Methods. SAGE Publications, latest edition. |
| <p>2. List Essential References Materials (Journals, Reports, etc.)</p> <ul style="list-style-type: none">i. Recent research papers in related to Research Methods |
| <p>3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.</p> <ul style="list-style-type: none">i. Access to research databases, e.g., IEEE, ACM, etc. |
| <p>4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p> <ul style="list-style-type: none">i. Decided by the course instructor |

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.)

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| <p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <ul style="list-style-type: none">i. One classroom (25 seats) |
| <p>2. Technology resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none">i. Whiteboardii. Internet connection |
| <p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> |

G Course Evaluation and Improvement Procedures

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| <p>1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none">iv. At the end of semester, course evaluation forms will be filled by the students electronically or on paper. The evaluation forms will be anonymous. |
| <p>2. Other Strategies for Evaluation of Teaching by the Instructor or the Department</p> <ul style="list-style-type: none">i. Course file of the course will be maintained and evaluated by some senior faculty member. |

ii. Instructor evaluation is performed for every semester
3. Procedures for Teaching Development ii. Constant reading of new books and research papers, attending related conferences and workshops, participation in the research groups and blogs etc.
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) i. A random sample from the marked papers may be evaluated by an independent senior faculty member. ii. Departmental quality assurance committee can review the students grades and course files to make sure that high standard of teaching is maintained.
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. i. Department has curriculum committee that periodically review courses. ii. Faculty council review offer program as per need.

Name of Course Instructor: Dr. Murtaza Ali Khan

Signature: Murtaza Ali Khan **Date Completed:** Oct. 22, 2018

Program Coordinator: _____

Signature: _____ **Date Received:** _____