The University of Jordan

Accreditation & Quality Assurance Center

<u>COURSE Syllabus</u>

الجامعة الأردنية

رمز النموذج : QF-AQAC-03.02B

اسم النموذج: مخططالمادةالدراسية

الإصدار: 1/1

التاريخ: 2107/01/3

الصفحات: 7/2

1.	Course title	Research Methodologies in Computer Science
2.	Course number	1901710
3.	Credit hours (theory, practical)	3 (Theory)
	Contact hours (theory, practical)	3 lectures per week & Presentation
4.	Prerequisites/co requisites	
5.	Program title	Master in Computer Science
6.	Year of study and semester (s)	First Year
7.	Final Qualification	Master degree of Computer Science
8.	Other department(s) involved in teaching the course	
9.	Language of Instruction	English
10.	Date of production/revision	May 2020
11.	Required/ Elective	Required

12. Course Coordinator:

Prof. Ahmad Sharieh, PhD   Office Location: KASIT Ground Floor –206
Department Office Phone Number:06-5355000ext.   22584   E-mail: sharieh@ju.edu.jo
Office Hours: Sunday, 2:30:3:30pm, Tuesday :3:00-4:00 pm

13. Other instructors:

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14. Course Description:

A. **Introduction**:

B. **Description:** This course concentrates on the research methodologies. The aim is to provide students with the knowledge of research types (quantitative and qualitative), and enable them to use the right tools for testing, collecting data, analysis it, and its interpretation. It includes topics: research methods; conducting research; using tools in research; conduct research, research design, testing hypothesis, collecting data and analyze it, present results, writing research manuscripts such report, paper, thesis, and proposal for research project..

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15. Course aims and outcomes:

A- The Goal: The aim of this course is to conduct a scientific research in computer science fields and write a research manuscript.

Course Objectives: When you completes this course, you will be able to

1. Knowledge and Understanding:

A1. (1) Build in-depth knowledge and understanding concepts, principles and theories related to research methods in computer science and computer applications.
A2. (2) Understand the basic concepts involved in a structured path of research in computer science and its application.
A3. (3) Establish a solid base and depth of the main facts and ideas related to the research in field of computer.

2. Intellectual Analytical and Cognitive Skills:

B1. (4) Obtain intellectual, analytical, and cognitive skills in problem solving techniques using algorithms and computational intelligence.
B2. (6) Improve the existing cognitive skills and analytical techniques for special topics related to computer science, applications, and research projects.

3. Subject-Specific Skills:

C1. (7) Gain subject-specific practical and professional skills by conducting research in computer structure; algorithms; distributed computing; computer networks, wireless networks, mobiles services and computer network security.
C2. (8) Gain subject-specific skills in design a research, analysis results of a research, produce database, build model, and test a developed system on real data or by simulation.

4. Transferable Key Skills:

D1. (10) Gain transferable skills to employment through application of research methodologies in computer science, research projects, presentations, and research report writing.

16. Topic Outline and Schedule:

Topics	Week	Assignments	ILOs
Introduction to Research Methodologies: Overview of research methodology.	1+2		A1-A3, B1, B2
Techniques of Defining Research Problem: What is a research problem? Defining and selecting a research problem.	3+4	A1: Explain the meaning of terminologies	B1-B2, C1-C2
Research Design: meaning, types, features of good design, developing research plan, data collection/generation methods.	5+6		A2, B1-B2, C1-C2, D1
Sampling Design: types of sampling, random samples, characteristics, steps in sampling and selecting samples.	7	A2: Sampling types and examples	B1-B2, C1-C2

Midterm	8		A1-A3, B1-B2, C1-C2
Measurement and Scaling techniques: measurements, scaling, errors, techniques.	9	A3: performance evaluation	C1-C2
Data Collecting: methods of collecting data, case studies, guide to collect data using different methods (observation, interview, questionnaire, second resource, experiment …).	10	A4: Review a research article	A3, B1-B2, C1-C2
Processing and Analysis of Data: statistical methods, presentation of data, interpretation.	11+12		C2, D1
Testing Hypothesis: methods of testing hypothesis.	13	A5: Confidence Interval and error	B1, C1-C2, D1
Writing Research Report: write a research paper, presentation.	14+15		D1
Final Exam	16		All

17. Evaluation Methods and Course Requirements (Optional):

Development of ILOs is promoted through the following <u>teaching and learning and Assessment methods</u>:

Teaching(T) Methods:

- Class contact is 3hours per week. The course will be delivered using different means like lectures, presentations, manuscript analysis, and discussion.
- Class lecture is1 hour, lecture notes and manuscript samples (survey, article, thesis, ...)

Learning(L)Methods:

- You should read the assigned topics before class, and participate in class and do whatever it takes for you to grasp this material. Also, ask any question related to Research Methodologies (RM).
- You are responsible for all material covered in the class and handout.
- Please communicate with me regarding any concerns or issues related to RM by either in class, course web page, phone or email.
- The webpage (*elearning.ju.edu.jo)* is a primary communication vehicle. Lecture notes, assignments, presentations and syllabus are available on the web.

Assessment(A)Methods:

- There will be several assessment methods of evaluation the performance of the students such as attending and class participation, quizzes and short Tests, Homework Assignments (20%), conducting the midterm (20%), Research Project (research article, report and presentation) (20%), and the final

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exam (40%).

Exams: The format for the exam is generally (but NOT always) as follows: Analyze a Problem, Short Essay Questions, Solving Problems, …, etc.

18. Course Policies:

A- Attendance policies:

- Excellent attendance is expected.
- The University of Jordan policy requires the faculty member to assign ZERO grade (F) if a student misses 10% of the classes without a valid excuse.
- Sign-in sheets will be circulated.
- Exams and handing in assignments on time:
- If you miss a class, it is your responsibility to find out about any announcement or assignment you may have missed.

B- Health and safety procedures:

For more details on University regulations, please visit: http://www.ju.edu.jo/rules/index.htm

C- Honesty policy regarding cheating, plagiarism, misbehavior:

- Cheating or copying on exam or quiz is an illegal and unethical activity.
- Standard University of Jordan policy will be applied.
- All graded assignments must be your own work (your own words).

D- Grading policy

Attending and class participation,
quizzes and short Tests,

Homework / Assignments	20%,
conducting the midterm	20%,
Research Project: Report and Presentation	20%,
Final exams	40%.

E- Intended scale is

| 0-49 | F | 50-59 | C- | 60-64 | C | 65-69 | C+ | 70-74 | B- | 75-79 | B | 80-84 | B+ |
| 85-89 | A- | 90-100 | A |

The grade may be given based on the average of all marks out of 100%.

F- Available university services that support achievement in the course:

. The webpage (elearning.ju.edu.jo) is a primary communication vehicle.

. Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints,

there will be a committee to review grading the final exam.

G- Statement on Students with disabilities

 Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

C- Required equipment:

Link to e-learning.ju.edu

Projector in the class and Programming Language and software package

D- References:

Textbook and supporting material:
Textbook:
1) C.R. Kothari, Research Methodology: Methods and Techniques, latest Ed., New Age International Publication,

2) Krishnan Nallaperumal and Annam Krishnan, **Engineering Research Methodology: A Computer Science and Engineering and Information and Communication Technologies Perspective**, Publisher: PHI Learning Private Limited, New Delhi, India, 2014.

Supporting material: Lecture Notes and videos on the e-learning Moodle.

Course Policies:

Exams	The format for the exams is generally (but NOT always) as follows: General Definitions, Multiple-Choice, True/False, Analyze and solve a Problem, Short Essay Questions, and etc.
Makeup Exams	Makeup exam should not be given unless there is a valid excuse.
Cheating	Cheating or copying on exam or research project is an illegal and unethical activity. Standard JU policy will be applied. All graded assignments must be your own work (your own words).
Attendance	Excellent attendance is expected. The University of Jordan policy requires the faculty member to assign ZERO grade F if a student misses 10% of the classes that are not excused. If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.

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E-   **Additional information:**

Expected Workload On average you should expect to spend about 9 hours per week on this module. Research, Lab, and Implementation work will be given to you prior to you every week and during the semester; you are expected to submit a paper, reports or a mathematical model, and simulation.

Practical submissions: The assignment that have work to be assessed will be given to the students in separate documents including the due date and appropriate reading material. Some work will be worked by your-self and some will be team works.

Feedback Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President.

For the final complaints, there will be a committee to review grading the final exam.

Date: May, 2020

Name of Course Coordinator: ---Ahmad Sharieh--------Signature: -----Ahmad Sharieh

Head of curriculum committee/Department: ------------------------- Signature: ---------------

Head of Department: ------------------------ Signature: --------------------------------

Head of curriculum committee/Faculty: ------------------------ Signature: --------------------

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Dean: -- -Signature: --------------------------------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File