1.	Course title	Research Methodology in Computer Science
2.	Course number	1901900
3.	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4.	Prerequisites/co requisites	N/A
5.	Program title	Computer Science
6.	Year of study and semester (s)	
7.	Final Qualification	PhD degree
8.	Other department(s) involved in teaching the course	None
9.	Language of Instruction	English
10.	Date of production/revision	March 21, 2023
11.	Required/ Elective	Required

12. Course Coordinator:

Dr. Sami Serhan
Office number: KASIT 107, Phone number: 22574
Office hours:

Sun, Tue, Thursday: 11:30 – 12:30,
Emailaddresses:samiserh@ju.edu.jo

13. Other instructors:

N/A

14. Course Description:

Topics discussed in this course include: Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Research Models. Significance of Research. Research Methods versus Methodology. Research Process. Criteria of Good Research. Defining the Research Problem. Research Design. Sampling Design. Measurement and Scaling Techniques. Methods of Data Collection. Processing and Analysis of Data. Writing a proposal. *Research papers of high impact published recently in the literature will be provided as reading assignments.*

15. Course aims and outcomes:

Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to…

-provide a deep and systematic understanding of the nature and conduct of Computer Science research
- equip students with the ability to undertake independent research
-enhance existing transferable key skills
-develop high-order transferable key skills
-remind students of the Legal, Social, Ethical and Professional issues applicable to the computer industry

-evaluate critically current research and advanced scholarship in Computer Science, and propose possible alternative directions for further work
-deal with complex issues at the forefront of the academic discipline of Computer Science in a manner, based on sound judgments, that is both systematic and creative
-demonstrate self-direction and originality in tackling and solving problems within the domain of Computer Science
-act autonomously in planning and implementing solutions in a professional manner

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16. Topic Outline and Schedule:

1)Research Methodology: An Introduction
Meaning of Research
Objectives of Research
Motivation in Research
Types of Research
Research Approaches
Significance of Research
Research Methods versus Methodology
Research and Scientific Method
Importance of Knowing How Research is Done
Research Process
Criteria of Good Research

2) Defining the Research Problem
What is a Research Problem?
Selecting the Problem
Necessity of Defining the Problem
Technique Involved in Defining a Problem

3) Research Design
Meaning of Research Design
Need for Research Design
Features of a Good Design
Important Concepts Relating to Research Design
Different Research Designs
Basic Principles of Experimental Designs

4) Sampling Design
Census and Sample Survey
Implications of a Sample Design
Steps in Sampling Design
Criteria of Selecting a Sampling Procedure
Characteristics of a Good Sample Design
Different Types of Sample Designs

5) Methods of Data Collection
Collection of Primary Data
Observation Method
Interview Method
Collection of Data through Questionnaires
Collection of Data through Schedules

6) Research Paradigm in Computer Science
Empirical
Mathematical
Engineering

7) Experimental computer science (vs. theoretical)

8) Basic vs. applied computer science research

9) Impact of the research

10) Case study (phd project)

11) Paper structuring and writing

12) Paper evaluation

13) Research techniques

14) Proposalk structuring and writing

17. Evaluation Methods and Course Requirements (Optional):

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

There will be several assessment methods of evaluation the performance of the students such as attending and class participation, analyze papers, assignments; midterm, the final exam, presentation and writing a research paper.

18. Course Policies:

A- Attendance policies:
Deliberate abstention from attending 1901900 classes and any other similar acts will lead to student deprivation from the course according to the UJ regulations

B- Absences from exams and handing in assignments on time:

If you miss the midterm or the short test, then a makeup exam will not be provided unless you submit a valid absence excuse, within three days from the midterm, to your lecturer. This excuse must be signed and stamped from the UJ hospital in order to be valid. If your lecturer accepts the excuse then you will be able to take the makeup. You need to follow up the departmental announcements regarding the makeup date and time. Please note that the lecturer may either accept or reject your excuse based on UJ regulations

C- Health and safety procedures:

N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All students in this course must read the University policies on plagiarism and academic honesty

http://registration.ju.edu.jo/RegRegulations/Forms/All_Regulations.aspx

E- Grading policy:

- *Midterm Exam: 30%*
- *Assignments and/or class participants 10%*
- *Presentation and writing a research paper20%*
- *Final Exam: 40%*

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

N/A

G- Statement on Students with disabilities

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.

19. Required equipment:

Class rooms with data shows

20. References:

Recommended books, materials, and media:

1) Research Methodology, Methods and Techniques, C.R. Cothari.
2)M. Berndtsson, J. Hansson, B. Olsson, B. Lundell, Thesis Projects: A Guide for Students in Computer Science and Information Systems, Springer 2008
3) R. A. Day, *How To Write & Publish a Scientific Paper*. Oryx Press, 1998.
4) E. W. Dijkstra, *Selected Writings on Computing: A Personal Perspective*, Springer-Verlag, 1982.
5) Dodig-Crnkovic G., Scientific methods in computer science, Conference for the Promotion of Research in IT at New Universities and at University Colleges in Sweden, Skövde. 2002
6) National Research Council, Academic Careers for Experimental Computer Scientists and Engineers, National Academy Press, Washington, D.C., 1994.
7) Wegner P., Research paradigms in computer science, Proceedings of the 2nd international conference on Software engineering, San Francisco, California, United States, Pages: 322 – 330, 1976.

21. Additional information:

Course website:
elearning.ju.edu.jo

Date: 21/03/2023----------

Name of Course Coordinator: --Sami Serhan----------Signature: ----------

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

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

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

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

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