اسم النموذج : خطة المادة الدراسية	رمز النموذج :	QFO-AP-VA-008	جامعة فيلادلفيا
الجهة المصدرة: نائب الرئيس للشؤون الأكاديمية	رقم الإصدار: (Rev)	2	Philadelphia University
الجهة المدققة : اللجنة العليا لضمان الجودة	تاريخ الإصدار:	2021-5-4	
	عدد صفحات النموذج :	4	

Course Title: Research Methods in Software Engineering	Course code: 072175100
Course Level: Master	Course prerequisite: -
Lecture Time: 13:00-16:00	Credit hours: 3

UR	☐	FR	☐	DR	▣	C	☐	E	☐

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. Omar AlSheikSalem	Associate Professor	IT Faculty 302	Posted on door	oalsheiksalem@philadelphia.edu.jo

The Learning Style Used in Teaching the Course

The Learning Style			
Blended Learning ☐			
Electronic Learning ☐			
Face-to-Face Learning ▣			
Face-to-Face	Electronic	Blended	Percentage
100%			

Course module description:
This course is intended for students already accepted to study for the MSc in Software Engineering in the Faculty of Information Technology. Students can expect to gain from the course the skills and techniques required to undertake research at MSc level. The course provides a foundation from which students may develop their competence and confidence to tackle research problems, to evaluate critically both their own and others' research, and to communicate their findings effectively. It covers material and advice on technical writing for the thesis and defending it. Research seminars undertaken as part of the Research Project contribute to this course.

The course will mix lectures with assignments and discussions. The purpose is to put the learned into practice, deepen your understanding, and prepare you for future research. The most important assignment is to write a paper.

Course module objectives:

This course aims to offer a grounding in various aspects of research and project management, from the most theoretical (philosophy of science), through the subject-specific (how to choose, refine and develop a research topic), to practical advice on undertaking research, including how to contribute to research, manage research projects, cope with the day-to-day research activity, etc. students will acquire insight into the philosophical and methodological fundamentals of scientific research. Such knowledge is necessary in order to complete a higher degree programme. In scientific theory, students will gain understanding and basic knowledge of central scientific paradigms and approaches. The intention is that students will develop the ability to understand and reflect on the demands of scientific research, how knowledge is defined and how it is verified. In this way, they will be able to evaluate the premises for knowledge production, its limits and possibilities. This knowledge will also form a basis for launching and pursuing individual student research efforts, and will also facilitate critical reflection on the research of others. Through instruction in research techniques, students will acquire an understanding of the ethical standards which must be satisfied in the planning and execution of research projects. Students will also learn about qualitative and quantitative methods, including the interpretation and application of statistical material..

Course/ module components

Textbook

9780135705056	Research Methods: A Process of Inquiry	Anthony M. Graziano (Author) Joey George Michael L. Raulin (Author)	Pearson	2020

Teaching methods:

Lectures, discussion groups, tutorials.
Duration: 16 weeks in the semester, 48 hours in total

Learning outcomes:

A-   Knowledge and Understanding :

–   be prepared for some of the demands of, and skills required for, work in IT and IT-related industries (A2)
-       having been introduced to the skills and knowledge necessary to undertake the project (A3)

 B-   Intellectual Skills :
-       Be prepared to undertake the Research Project, through developing original ideas in a research context. (B2)
C- Practical Skills:

-       Have skills and knowledge necessary to undertake the project (C3)

D- Transferable Skills:
–   Be able to prepare and present a research seminar to an audience of researchers (D2)
–   Be able to prepare a thesis and reports to a professional standard (D3)
–   To practice the time-management for research projects. (D5)

Learning Outcomes Achievement

Module Number	Module Name	A1	A2	B1	C1	D1	D2	D3
073132100	Systems Analysis and Design	A,D	A,D	A,D		D	A,D	A,D

Development (D): A2, A3, B2, C3, D1, D2, D3, are developed through lectures, home works, tutorials. and lab sessions

Assessment (A): A2, A3, B2, C3, D1, D2, D3 are assessed by quizzes, Assignments, written exams, and labs work.

<u>**Assessment instruments**</u>

- Short reports and/ or presentations, and Short research projects
- Quizzes.
- Home works
- Final examination

Allocation of Marks	
Assessment Instruments	**Mark**
Midterm examination	**30**
Reports, research projects	**30**
Final examination:	**40**
Total	**100**

Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.

<u>**Documentation and academic honesty**</u>

- Documentation style (with illustrative examples)

- Submit your homework covered with a sheet containing your name, number, course title and number, and type and number of the home work (e.g. assignment, and project).
- Any completed homework must be handed in the class on the due date. After the deadline "zero" will be awarded. You must keep a duplicate copy of your work because it may be needed while the original is being marked.
- You should hand in with your assignments:
- A brief report to explain your findings.
- Your solution of given problem
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- For the research report, you are required to write a report similar to a scientific research paper. It should include:
- Abstract: It describes the main synopsis of your paper.
- Introduction: It provides background information necessary to understand the research and getting readers interested in your subject. The introduction is where you put your problem definition, summary of contribution, related work, and is likely where the bulk of your sources will appear.
- Methods (Algorithms and Implementation): Describe your methods here. Summarize the algorithms (if any) generally, highlight features relevant to your project, and refer readers to your references for further details. Information from sources must be rephrased in own words, "copy-and-paste" from documents, found for example on the Internet, is NOT allowed. It is allowed to use short quotations, or figures, from other documents, but then the source MUST be clearly stated in the reference list (please check copy rights). Papers not fulfilling these rules will be failed.
- Results and Discussion (Benchmarking and Analysis): This section is the most important part of your paper. It is here that you demonstrate the work you have accomplished on this project and explain its significance. The quality of your analysis will impact your final grade more than any other component on the paper. You should therefore plan to spend the bulk of your project time not just gathering data, but determining what it ultimately means and deciding how best to showcase these findings.
- Conclusion: The conclusion should give your reader the points to "take home" from your paper. It should state clearly what your results demonstrate about the problem you were tackling in the paper. It should also generalize your findings, putting them into a useful context that can be built upon. All generalizations should be supported by your data, however; the discussion should prove these points, so that when the reader gets to the conclusion, the statements are logical and seem self-evident.
- Bibliography: Refer to any reference that you used in your assignment. Citations in the body of the paper should refer to a bibliography at the end of the paper.

- Protection by copyright
  1. Coursework, laboratory exercises, reports, and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
  2. Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.
  3. Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

- Avoiding plagiarism.

1. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.

2. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.

3. Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.

4. Plagiarism is a serious offence and will always result in imposition of a penalty. In deciding upon the penalty the Department will take into account factors such as the year of study, the extent and proportion of the work that has been plagiarized, and the apparent intent of the student. The penalties that can be imposed range from a minimum of a zero mark for the work (without allowing resubmission) through caution to disciplinary measures (such as suspension or expulsion).

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	*1. Introduction to research in science/* Research Engineering: concepts and processes, scientific process, model of research process	
(2)	*2. Research Engineering methodologies/* Prescriptive, evolutionary, agile	
(3)	*3. Research project management methods/* Planning process, selection of methodology, Activities planning, Risk Case study	
(4)	*4. Research problem statement methods/* Problems type, variables types, ethics, library research, proposal developing methods Case study	
(5)	*5. Research Analysis & Design Methods/* Divide and Conquer, stepwise refinement, generalization, problem relationship, formal def.	
(6)	Single variable and independent groups, correlated groups, and factorial designs	**Assignment 1**
(7)	*6. Research development methods/*	

	Naturalistic, case study, correlational, differential research	
(8)	Field, program evaluation, surveys research	
(9) *Midterm Exam*	Field, program evaluation, surveys research	
(10)	*7. Research evaluation methods/* Measurement, Statistical analysis, hypothesis testing, simulation, related works	
(11)	*8. Research writing methods/ Writing a RR in APA publication style method and tools*	**Assignment 2**
(12)	*9. Research presenting methods/* Presenting methods and tools Case study	
(13)	*Referencing*	
(14)	*10. Research methods perspectives/ New directions in research methodologies*	**Assignment 3**
(15) **Specimen examination (Optional)**	*10. Research methods perspectives/ New directions in research methodologies*	
(16) **Final Examination**	*Revision*	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

1. C. R. Kotheri, Research Methodology: Methods and Techniques, New Age International, 2004
2. John W. Creswell, Research Design: Qualitative , Quantitative and Mixed Methods Approach, Sage Publications, 2003
3. Crawford, H. J. and Christensen, L. J., Developing Research Skills, 4th edition, Allyn and Bacon, 2001

4. Donald H. McBurney, Research Methods, Wadsworth, 2000
5. Lawrence R. Frey, Carl H. Botan, and Gary L. Kreps, Investigating Communication: An Introduction to Research Methods, Allyn and Bacon, 2000
6. Victor O. K. Li, Hints on Writing Technical Papers and Making Presentations, IEEE Transaction on Education, Vol. 42, N0. 2, May 1999.
7. Compton R. T. Jr., Fourteen Steps to a Clearly Written Technical Paper, IEEE Circuits and Device Magazine, Sep. 1992

Journals
    Journal of IT

Websites
1. http://ecourse.philadelphia.edu.jo/login/index.php   // e-course web page
2. http://www.ablongman.com/graziano6e   // textbook site
3. www.cs.iastate.edu/~honavar/grad-advice.html
4. http://research.microsoft.com/~simonpj/papers/giving-a-talk/giving-a-talk.html
5. http://owl.english.purdue.edu/
6. http://owl.english.purdue.edu/handouts/index.html
7. http://www.idt.mdh.se/kurser/ct3340/ht07/