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

Course Title: Requirements Engineering	**Course code: 721712**
Course Level: 7 (SE MSc)	**Course prerequisite (s) and/or corequisite (s):**
Lecture Time: Saturday, 09:00 – 12:00, IT336	**Credit hours: 3**

UR □	**FR** □	**DR** ■	**C** □	**E** □

Academic Staff Specifics

Name	Rank	Office Location	Office Hours	E-mail Address
Dr. Said Ghoul	**Prof**	**IT 307**	12:00-13:00	sghoul@philadelphia.edu.jo

The Learning Style Used in Teaching the Course			
Blended Learning □			
Electronic Learning □			
Face-to-Face Learning ■			
Face-to-Face	**Electronic**	**Blended**	**Percentage**
100%			

Software Engineering MSc Program
2021-2022.1

Course Description

This course is intended for students already accepted to study the MSc in Software Engineering at Philadelphia University. It is designed to prepare MSc students to do research in software requirements. It introduces important ideas across the breadth of requirements engineering and the major research strategies of the field. Students will become familiar with the structure of the field; they will learn the seminal ideas and developments that led to current research questions; they will learn to critique research papers, to evaluate their claims and evidence; and they will also become familiar with the current software engineering community research themes.

Course Objectives

The MSc. Requirements Engineering is a research course. Accordingly, its desired outcomes focus primarily on capabilities in research and education, together with expectations of capabilities in the subject area of software design and development. This differs from undergraduate and professional masters Software Engineering courses, which focus on proficiency in software design and development. In particular, it is expected that the following will be outcomes of MSc. course:

- *Ability to do independent research in Software Engineering.* MSc.s must have the ability to carry out independent research – to select significant practical problems, solve them in creative ways, evaluate them critically, demonstrate the validity of the solution, and gather the resources to carry out the work. This is the absolutely essential capability of a MSc.
- *Skill in several research methods in Software Engineering*. MSc.s will have broad knowledge with the research methods of the field, empirical and formal (symbolic) methods, together with the ability to evaluate the application of a research method and to select the appropriate research method for a specific research project.
- *Broad general knowledge of SE*. MSc.s are broadly knowledgeable in their field. They have software design and development skills, and they are familiar with issues in computer science at large. They exercise this knowledge both within the discipline and in the public realm, and they seek relevant knowledge from other fields.

- *Ability to teach a range of software courses*. MSc.s will be technical leaders. As such, they will be able to organize a body of knowledge so it can be taught to others and should be able to plan presentations and other activities to teach that material. This requires communication with non-experts as well as experts.
- *Communication skills*. MSc.s will be able to communicate effectively about technical material both within and outside of their specialization, both to other researchers and also to policy makers and the public.
- *Deep understanding of practical software issues*. MSc.s will ground their research in a deep understanding of software engineering practice. In addition to basic software design and development skills, they will have an in-depth understanding, drawn from personal observation, of practical software engineering issues. These include the implications of development at scale, the gnarly engineering tradeoffs and conflicts that arise in practice, and the tangle of technical, business, and often policy issues that are imposed by project context.
- *Broad, mature, multidisciplinary perspective*. MSc.s will be prepared for interdisciplinary collaboration and professional leadership. This depends on their ability to view SE critically; to understand how software-intensive systems interact with larger issues in society, business, socio-economic impacts, and public policy; and to appreciate the perspective of both collaborators and competitors.

Course Components

Textbooks

Chris Stevensen. Effective User Stories: How to write great user stories for software development teams! Independently published, 2020

Recent research papers in Requirements Engineering will be provided by the lecturer.

Teaching Methods (TM)

Duration: 15 weeks, 45 hours in total. Lectures: 15 hours, 1 per week. Tutorial (case study in classroom): 21 hours, 2 per week. Seminar: 3 (15 mn at the end of each lecture). Laboratories: 15 hours in total, 1-hour per week (free lab). Exams: 6 hours (3h for the mid and 3 for final exam). The last week is reserved to homework examination.

Learning Outcomes (LO)

A. Knowledge and understanding

A1. *Broad general knowledge of Software Engineering*
A2. *Broad, mature, multidisciplinary perspective*

B. Intellectual skills (thinking and analysis)

B1. *Ability to do independent research in Software Engineering*.
B2. *Skill in several research methods in Software Engineering*

C. Practical skills

C1. *Ability to teach a range of software courses*
C2. *Deep understanding of practical software issues*

D. Transferrable skills

D1. *Communication skills*
D2. *Be able to display an integrated approach to reuse skills,*
D3. *Strike the balance between self-reliance and seeking help when necessary in new situations, and display personal responsibility by working to multiple deadlines in complex activities in Software Engineering*.

Learning Outcomes Achievement and Assessment

A1and A2 are ***Achieved*** through lectures and ***Assessed*** by quizzes and written examinations

B1, B2, C1, C2, C3, D1, D2, and D3 are ***Achieved*** through lectures, tutorials, seminars, and homework. They are ***Assessed*** through homework.

Assessment Instruments

Allocation of Marks	
Assessment Instruments	**Mark**
Midterm examination (written, returned exam sheet and marking scheme)	**30%**
Final Exam (written, unseen exam sheet, returned marking scheme)	**40 %**
Homework: Seminars, research projects, and practical work (face to face)	**30%**
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.*

Practical Submissions

The assignments that have work to be assessed will be given to the students in separate documents including the due date and appropriate reading material.

Documentation and Academic Honesty

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:

1. A brief report to explain your findings.
2. Your solution of given problem

For the research report, you are required to write a report similar to a scientific research paper. It should include:

3. *Abstract:* It describes the main synopsis of your paper.
4. *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.
5. *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.
6. *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.
7. *Conclusion and perspectives:* 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.
8. *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	HW
1	*Part 1/ Engineering Science* *Chapter 1. Introduction to Engineering Science & Software Engineering Fundamentals* Fundamentals of Engineering Science & Requirements Engineering	
2	*Chapter 1 (continued)* *Tutorials based on relevant research works papers*	Ch. 1 HW
3	*Chapter 2. Requirements Engineering Research* Research approaches and levels	
4	*Chapter 2 (continued)* *Tutorials based on relevant research works papers*	Ch. 2 HW
5	*Part 2/ Requirement Engineering Models & Languages* *Chapter 3. Requirement Engineering Models & Languages* *Use case, Goal, Feature and Formal Models*	
6	*Chapter 3 (continued).* *Tutorials based on relevant research works papers*	
	Chapter 3 (continued). *Tutorials based on relevant research works papers*	Ch 3. HW
6	*Chapter 4. Data intensive systems Requirements modeling* Data intensive systems requirements models and Languages	.
7	*Chapter 4 (continued).* *Tutorials based on relevant research works papers*	Ch 4. HW
8	**Mid Exam**	
9	*Part 3/ Requirement Reengineering* *Chapter 5. Requirements Evolution* Requirements reverse engineering, *Requirements Reengineering*	
10	*Chapter 5(continued).* *Tutorials based on relevant research works papers*	Ch 5. HW
11	*Part 4/ Requirement Quality* *Chapter 6. Requirements Process Quality* *Introduction, CMMI*	
12	*. Chapter 6(continued).* *Tutorials based on relevant research works papers*	Ch 6. HW
13	Revision and General Tutorials, solution of precedent final	
14	**Homework Exam**	
15	**Written Final Exam**	

Expected workload

On average, students need to spend 3 hours of study and preparation for each lecture/tutorial session

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 college/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 (sample)-

Students will be expected to give the same attention to these references as given to the Module textbook(s):

Lecturer related Research papers (provided in the course along with course chapters and in tutorials)
In Journal

1. A Feature Model Based Configuration Reuse for Context-aware Systems. Computers, Materials & Continua. Under press, 2021
2. A Holystic Self-adaptive systems model, International Journal of Software Engineering & Applications (IJSEA), 12, 2/3, May 2021. https://aircconline.com/ijsea/V12N3/12321ijsea01.pdf
3. Requirements Variability Specification For data Intensive Software. International Journal of Software Engineering & Applications (IJSEA), Vol.10, No.2, March 2019. http://aircconline.com/ijsea/V10N2/10219ijsea03.pdf
4. Bio-Inspired Requirements Variability Modeling with use Case. International Journal of Software Engineering & Applications (IJSEA), Vol.10, No.2, March 2019. http://aircconline.com/ijsea/V10N2/10219ijsea05.pdf
5. A Feature Based Methodology for Variable Requirements Reverse Engineering. American Journal of Software Engineering and Applications (AJSEA), 8(1): 1-7, 2019 http://article.sciencepublishinggroup.com/pdf/10.11648.j.ajsea.20190801.11.pdf
6. A Genetic Framework model for Self-Adaptive software. Journal of Software Engineering Volume 11, 2017
7. Software Evolution: A Features Variability Modeling Approach. Journal of Software Engineering Volume 11, Number 1, 12-21, 2017. http://scialert.net/qredirect.php?doi=jse.2017.12.21&linkid=pdf
8. A Road Map to Bio-inspired Software Engineering. Research Journal of Information Technology Volume 8, Number 3, 75-81, 2016. http://scialert.net/qredirect.php?doi=rjit.2016.75.81&linkid=pdf
9. Systems Versioning: A Features-Based Meta-modeling Approach. ONLINE SPECIAL JOURNAL ISSUES. published in International Science Index Vol:8 No:06, 2014 at www.waset.org/Publications.

10. Program Slicing: Precise shops extraction Approaches.Hand book of Software Engineering & Knowledge Engineering, Vol. 1, Fundamentals, S.K. Chang (editor), Word Scientific Publishing, 2001.
11. A New Approach for Program Integration. *The South African Computer Journal, SART/SACJ, N° 25, ISSN 1015-7999, August 2000, pp. 3-11*

In proceedings of international Conferences

1. Systems Versioning: A Features-Based Meta-deling Approach". ICFSE 2014: International Conference on Forensic Software Engineering" , London, United Kingdom, Jun 29-30, 2014
2. Supporting AOP by Bio-inspired concepts. IEEE Xplore, 2011. Supporting Aspect-Oriented Paradigm by bio-inspired ...
3. A Methodology for AUML role moeling. IEEE Xplore, 2011. IEEE Xplore *Abstract* - A methodology for AUML role modeling

.

In Books

1. *A Genetics-Based approach to inheritance modeling.* LAP LAMBERT Academic Publishing, October, 2017. https://www.morebooks.de/store/gb/book/a-genetics-based-approach-to-inheritance-modeling/isbn/978-620-2-05043-2
2. Software Evolution: A Features Variability Modeling Approach. LAP LAMBERT Academic Publishing, December, 2016. https://www.amazon.de/Feature-based-Variability-Modelling-Software-Evolution/dp/3330000104
3. A Textual Software Product Lines Design Model By Mixing Class and Feature Concepts. LAP LAMBERT Academic Publishing, May 20, 2014 (see http://www.amazon.com/Textual-Design-Mixing-Feature-Concepts/dp/3659525510

Website(s):
http://ecourse.philadelphia.edu.jo/login/index.php // Prof. Said
http://www.inf.ed.ac.uk/teaching/courses/seoc/2004_2005/notes/LectureNote02_RequirementsEngineering.PDF
http://www.springer.com/us/book/9783642242908 // book