

QFO-AP-FI-MO02	اسم النموذج: Course Syllabus	جامعة فيلادلفيا
رقم الاصدار : 1 (Revision)	الجهة المصدرة: كلية تكنولوجيا المعلومات	
التاريخ: 2017/11/05	الجهة المدققة: عمادة التطوير والجودة	Philadelphia University
عدد صفحات النموذج:		

Course Title: Modeling and Computer Simulation	Course code: 750472
Course Level: 4	Course prerequisite(s) and/or corequisite(s): 750272
Lecture Time: 10:10-11:00	Credit hours: 3

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address

Course Description:

Computer simulation is important subject as it is complementary to laboratory field experimentation. Modeling a given problem and simulating it could lead to better results through discussing the model and enhancing it before the actual model is built.

Course Objectives:

This module aims to present methodologies used in computer simulation, to show simulation as complementary to laboratory field experimentation in the development of better understandings of complex phenomena, and to discuss analysis, appropriate use, and limitations of simulation models. The module presents applications of software simulation process with supporting techniques.

Course Components

- Modeling
- Scope of Simulation
- Types of Simulation
- Random number (Concepts, Algorithms for generation), Testing methods
- Random Variable
- Gathering Observations (Concepts, Replication method),
- Simulation Language GPSS

Text book:

Discrete Event Simulations - Development and Applications

By Eldin Wee Chuan Lim, ISBN 978-953-51-0741-5, 196 pages, Publisher: InTech, Chapters published September 06, 2012

Teaching Methods:

Duration: 16 weeks, 48 hours in total

Lectures: 33 hours (2-3 per week)

Tutorials: 12 hours (1 per 2 weeks)

Seminars: 3 hours (in last 3 weeks)

Learning Outcomes:

A- Knowledge and understanding

- A1- Understand different methods for random number and random variables generation.
- A2- Have a clear understanding of the need for the development process to initiate the real problem.
- A3- Have a clear understanding of principle and techniques of simulation methods informed by research direction.
- A4- Know & understand a wide range of software and hardware used in development of computer simulation programs.

B- Intellectual skills (thinking and analysis)

- B1- Be able to describe the components of continuous and discrete systems and simulate them
- B2- Be able to implement numerical algorithm to meet simple requirements.
- B3- Be able to discuss the simulation methods and select the suitable technique on the problems.
- B4- be able for self-learning by using the e-courses.

C- Practical Skills.

- C1- Plan and undertake a major individual / group project in the areas of simulation.
- C2- Prepare technical reports on different simulation algorithms.
- C3- Give technical presentations of final assignment.
- C4- Use the scientific literature effectively of modeling and simulation and make discriminating use of Web resources.
- C5) Design, write, and debug simulation programs in GPSS language.
- C6) Use appropriate computer-based design support tools.

D- Transferable skills.

- D5-Know how to simulate any discrete system using queuing systems
- D6-Be able to work effectively with others

Learning outcomes achievement:

- **Assessment:** A1-A3, B1, B2, B4, are assessed by quizzes and examinations; A4, B3, C1-C6 D5, and D6 are assessed by assignments and lab work.
- **Development:** A1, A2, A3, A4, B1, B3, C1, and C2 are developed through the lectures. B1, B2, C2 and D5 are developed through Tutorials and Lab sessions, B4, C3, C4, C5, C6, and D6 are developed through Homework and assignments.

Assessment Instruments

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	20%
Second examination	20%
Quizzes and Home works	10%
Final Project	10%
Final Exam (written unseen exam)	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.*

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 home work covered with a sheet containing your name, number, course title and number, and type and number of the home work (e.g. tutorial, assignment, and project).

Any completed homework must be handed in to my office (room IT ---) by 15:00 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 printed listing of your test programs (if any).
- 2- A brief report to explain your findings.
- 3- Your solution of questions.

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

- a. **Abstract:** It describes the main synopsis of your paper.
- b. **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 in context and is likely where the bulk of your sources will appear.
- c. **Methods (Algorithms and Implementation):** Describe your methods here. Summarize the algorithms generally, highlight features relevant to your project, and refer readers to your references for further details.
- d. **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.

- e. **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.
- f. **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 Academic Calendar

Week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Modeling	
(2)	Modeling	Tutorial 1
(3)	Modeling	Tutorial 2, Assignment 1
(4)	Scope of Simulation	Tutorial 3
(5)	Types of Simulation (Next Event Scheduling)	Tutorial 4
(6)	Types of Simulation (Activity scanning)	

First Exam		
(7)	Types of Simulation(Three processes orientation ABC method)	Tutorial 5
(8)	Random number (Concepts, Algorithms for generation), Tutorial 6	Tutorial 6, Assignment 2
(9)	Random number (Testing methods)	Tutorial 7
(10)	Random Variable (Concepts, Types of distributions)	Tutorial 8
(11)	Random Variable(Continue the types of distributions)	Tutorial 9, Assignment 3
(12)	Improving random variables (Variance reduction method, Layers method)	Project
Second Exam		
(13)	Gathering Observations (Concepts, Replication method)	Tutorial 10
(14)	Gathering Observations (sub-interval, cycle method)	Tutorial 11
(15) Specimen examination (Optional)	Simulation Language GPSS,	Tutorial 12
(16) Final Examination	Seminars	

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 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

- 1- Simulation With Arena, by W. D. Kelton, R. P. Sadowski, and D. T. Sturrock, " 5th Edition, 2010.

Web Material

<http://www.gobookee.org/search.php?q=Simulation+and+modelling>