



<b>Course</b>	Computer Performance Evaluation – 0907702	(3 Cr. – Elective Course)
<b>Catalog Description</b>	Issues in Performance Evaluation and Benchmarking. Measurement Tools and techniques, Trace Driven and Execution Driven Simulation. Choice of metrics. Benchmarks. Statistical techniques for Performance Evaluation. Trace Generation and Validation, Synthetic Traces, Verification of Simulators. Design of Experiments. Analytical Modeling of Processors, Statistical modeling, Hybrid Techniques. Application of queuing theory, Markov models and probabilistic models for computer system evaluation. Workload Characterization.	
<b>Prerequisites by Course</b>	None	
<b>Prerequisites by Topic</b>	Students are assumed to have a background in the following topics: <ul style="list-style-type: none"> <li>• Statistics</li> <li>• Computer Organization</li> <li>• Computer Architecture</li> </ul>	
<b>Textbook</b>	Raj Jain, The Art of Computer Systems Performance Analysis, Wiley, 1991.	
<b>References</b>	<ol style="list-style-type: none"> <li>1. Hennessy and Patterson. Computer Architecture: A Quantitative Approach, 5th ed., Morgan Kaufmann, 2011.</li> <li>2. A. Law, Simulation Modeling &amp; Analysis, 4th ed., McGraw Hill, 2007.</li> </ol>	
<b>Course Website</b>	<a href="http://www.abandah.com/gheith/?page_id=1955">http://www.abandah.com/gheith/?page_id=1955</a>	
<b>Facebook group</b>	<a href="https://www.facebook.com/groups/326276797534035/">https://www.facebook.com/groups/326276797534035/</a>	
<b>Schedule &amp; Duration</b>	15 or 12 weeks; 45 lectures, 50 minutes each; or 30 lectures, 75 minutes each (including exams)	
<b>Student Material</b>	Textbook, class handouts, some instructor keynotes, and access to a personal computer and the internet.	
<b>College Facilities</b>	Classroom with whiteboard and projection display facilities, library, and computer laboratory.	
<b>Course Objectives</b>	<p>The purpose of this course is to introduce the main research methodologies in computer engineering to the graduate student. It is designed to achieve the following objectives:</p> <ul style="list-style-type: none"> <li>• Provide awareness about research methodologies and performance evaluation and benchmarking</li> <li>• Introduce measurement tools and techniques</li> <li>• Introduce trace driven and execution driven simulation</li> <li>• Introduce various experiment design methodologies</li> </ul>	
<b>Course Outcomes and Relation to ABET Program Outcomes</b>	<p>Upon successful completion of this course, a student should:</p> <p>Research modern techniques in performance evaluation in computer engineering. [iii,iv]</p> <p>Ability to evaluate performance of alternative processor, memory, and network designs. [ii]</p>	

- Demonstrate a sound, in-depth, and up-to-date technical knowledge of research methodologies [i]
- Demonstrate a sound, in-depth, and up-to-date technical knowledge of experiment design [i]
- Demonstrate a sound, in-depth, and up-to-date technical knowledge of simulation techniques [i]

Course Topics	Topic	Textbook Chapters	Hrs
	1. Overview of Performance Evaluation	1-3	6
	2. Measurement Techniques and Tools	4-7, 9-11	9
	3. Simulation	24-28	15
	4. Probability Theory and Statistics	12, 14, 15	9
	5. Experimental Design and Analysis	16-19	6

**Computer Usage** Practical aspects of the course are covered in class and through the term project.

Important Dates	Date	Event
	Mon 28 May, 2018	Classes Begin
	Mon 2 Jul, 2018	Midterm Exam
	Wed 11 Jul, 2018	Term project proposal is due
	Mon 6 Aug, 2018	Term project report is due and start of project demonstrations
	Wed 8 Aug, 2018	Last Lecture
	Tue 14 Aug, 2018	Final Exam

- Policies**
- Attendance is required. Class attendance will be taken every class and the university's polices will be enforced in this regard.
  - All submitted work must be yours
  - Cheating will not be tolerated
  - Open-book exams
  - Join the Facebook group of this course
  - Check department announcements at: <https://www.facebook.com/Master-in-Computer-Engineering-and-Networks-in-the-University-of-Jordan-257067841079897/> for the program announcements.

**Assessments** Exams, Projects, Reports, and Presentations

<b>Grading policy</b>	Term project report and presentation	30%
	Midterm Exam	30%
	Final Exam	40%

**Instructors** **Prof. Gheith Abandah**, [abandah@ju.edu.jo](mailto:abandah@ju.edu.jo)  
**Homepage:** <http://www.abandah.com/gheith>  
**Office Hours:** Sun & Tue: 11:00 – 12:00  
 Mon & Wed: 10:00 – 11:00

**Time and Location** Section 1: Mon and Wed: 4:00–6:00 (2:40-4:20 In Ramadan), CPE 001

### Program Learning Outcomes (PO)

i	Demonstrate a sound, in-depth and up-to-date technical knowledge in the field of specialization.
ii	Ability to identify and solve engineering problems in their chosen field of study.
iii	Acquire the skills for continued professional development and independent self-study.
iv	Demonstrate the ability to communicate technical information effectively and professionally both orally and in writing.

**Last Updated:** May 28, 2018