CPE703: Research Methodology

Course Introduction

Prof. Gheith Abandah
أ.د. غيث علي عبندة

Outline

- Course Information
- Textbook and References
- Course Objectives and Outcomes
- Course Topics
- Policies
- Grading
- Important Dates

Course Information

- Instructor: **Prof. Gheith Abandah**
- Email: **abandah@ju.edu.jo**
- Office: **CPE 406**
- Home page: **http://www.abandah.com/gheith**
- MS Team: **Link**
- Prerequisites: **None**
- Office hours: **Sun – Thu, 8:30 – 14:00**

Textbook and References

1. Wayne Booth, George Colomb, Joseph Williams, Joseph Bizup, and William FitzGerald, **The Craft of Research**, 4th Edition, The University of Chicago Press, 2016.
2. Raj Jain, **The Art of Computer Systems Performance Analysis**, Wiley, 1991.
3. Course **slides** at: http://www.abandah.com/gheith/?page_id=2842

- References:
  4. Hennessy and Patterson, Computer Architecture: A Quantitative Approach, 6th ed., Morgan Kaufmann, Elsevier Inc., 2017.
  5. Peter Bock, Getting It Right: R&D Methods for Science and Engineering, Academic Press, 2001.
  6. C.R. Kothari, Research Methodology, Methods and Techniques, 2nd Edition, New Age International Publishing, 2004.

Course Objectives

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:

- Provide awareness about research methodologies and performance evaluation and benchmarking
- Introduce measurement tools and techniques
- Introduce trace driven and execution driven simulation
- Introduce various experiment design methodologies
- Introduce various sources of information for literature review and data collection
- Develop an understanding of the ethical dimensions of conducting applied research
- Appreciate the components of scholarly writing and evaluate its quality

Course Outcomes

a.	Define research; explain and apply research terms; describe the research process and the principle activities, skills and ethics associated with the research process.	[1, 3, 7, 8]
b.	Demonstrate the ability to choose methods appropriate to research aims and objectives.	[1, 5, 7]
c.	Understand the limitations of particular research methods.	[1, 3, 4, 8]
d.	Develop skills in qualitative and quantitative data analysis and presentation.	[1, 3, 7]
e.	Understand the importance of research ethics and integrate research ethics into the research process.	[1, 4, 6]
f.	Develop advanced critical thinking skills.	[2, 7]
g.	Demonstrate enhanced writing and presentation skills.	[4, 5]

Course Topics

Topic	Week	Achieved ILOs	Evaluation Methods	Refs.
Research, Researchers, and Readers	1	a	Exams and Reports	1(I)
Asking Questions, Finding Answers	2	a	Exams and Reports	1(II)
Making an Argument	3	a	Exams and Reports	1(III)
Writing Your Argument	4	a, g	Exams and Reports	1(IV)
The Ethics of Research	5	a, f	Exams and Reports	1(V)
Performance Evaluation Introduction, Common Mistakes, Selection of Techniques and Metrics	6	b, c, d	Exams	2(1-3)
Types of Workloads, Workload Selection, Workload Characterization Techniques, Monitors	8	b	Exams	2(4-7)
Data Presentation, Ratio Games	9	d	Exams	2(10-11)
Summarizing Measured Data, Comparing Systems	10	d	Exams	2(12-13)
Introduction to Experimental Design, 2^k Factorial Designs	11	b, c, d	Exams	2(16-17)
Introduction to Simulation, Analysis of Simulation Results	12	b	Exams	2(24-25)
Project Presentations	13	a – g	Presentations	1-6

Policies

- Attendance is required
- All submitted work must be yours
- Cheating will not be tolerated
- Open-book exams
- Join the Microsoft Team at: Link
- Check department announcements at: https://www.facebook.com/Master-in-Computer-Engineering-and-Networks-in-the-University-of-Jordan-257067841079897/

Grading

- Term Project’s Report and Presentation 30%
- Midterm Exam 30%
- Final Exam 50%

Important Dates

Sun 27 Feb, 2022	First Lecture
Sun 24 Apr, 2022	Midterm Exam
Sun 8 May, 2022	Term project proposal is due
Sun 5 Jun, 2022	Term project report is due and project demonstrations
Sun 5 Jun, 2022	Last Lecture
Jun 11 – 23, 2022	Final Exam Period