

UNIVERSITI TEKNOLOGI MARA CSC784: RESEARCH METHODS IN COMPUTER SCIENCES

| Course Name | RESEARCH METHODS IN COMPUTER SCIENCES APPROVED | |
|---------------------------|---|--|
| (English) | | |
| Course Code | CSC784 | |
| 1107.0 111 | | |
| MQF Credit | 3 | |
| Course Description | CSC784 is a research methodology course specifically designed for post graduate students seeking masters or PhD degrees in Computer Science. It prepares students with skills related to research, critical reviews of scientific articles, writing and reporting scientific results. | |
| Transferable Skills | research skills, presentation, writing and reporting scientific results | |
| Teaching Methodologies | Lectures, Discussion, Presentation, Journal/Article Critique | |
| CLO | CLO1 Demonstrate the necessary foundations to conduct research CLO2 Develop appropriate research methodology framework for a research project related to the field of Computer science CLO3 Write an academic report for a research project CLO4 Give an oral presentation | |
| Pre-Requisite Courses | No course recommendations | |

Topics

1. Overview of Research

1.1) A research concept, Why do you go into research?, What makes a good research?, Research vs. Development, Research in Computer Science

2. Research Process
2.1) Identifying research area, constructing problem statement, LR, research design, measuring & data gathering, data analysis & reporting

3. Problem Definition

3.1) problem statement, objectives, research questions, hypothesis

4. Literature Review

4.1) systematic LR process

5. Research design

5.1) constructive approach, empirical approach, qualitative approach, mathematical approach

6. Research methods

6.1) experiment, survey, case study, observation

7. Optimization 7.1) Type of Optimization Techniques, Methods of Optimization

8. Complexity Analysis

8.1) Big-Oh notation

9. Report Writing

9.1) How to write scientific articles, Formats (APA, IEEE), Tips in writing

10. Presentation

10.1) making the slides, tips for good presentation

11. Evaluation

11.1) Test 1

12. Evaluation

12.1) Test 2

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13. Research Proposal 13.1) Topics, contents, format

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| Assessment Breakdown | % |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

| Details of | | | | |
|--------------------------|--------------------|------------------------|--------------------|------------------------------|
| Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
| | Assignment | Assignments | 20% | CLO1 , CLO2 , CLO3 , CLO4 |
| | Test | TEST 1 | 20% | CLO1 |
| | Test | TEST 2 | 20% | CLO1, CLO2 |

| Reading List | Recommended Text | Roderick Melnik 2015, <i>Mathematical and Computational Modeling</i> , Wiley [ISBN: 1118853989] | | |
|--------------------|---|---|--|--|
| | | Ronald S. King 2012, Research Methods for Information Systems, Mercury Learning & Information [ISBN: 1936420120] | | |
| | | Christina Silver,Ann Lewins 2014, <i>Using Software in Qualitative Research</i> , SAGE Publications Limited [ISBN: 1446249735] | | |
| | | Gerald Graff,Cathy Birkenstein,Russel Durst 2011, "They Say/I Say", W. W. Norton [ISBN: 0393912752] | | |
| | | Bonnie Tensen 2012, Research Strategies for a Digital Age, Cengage Learning [ISBN: 0840028822] | | |
| | Reference Book Resources | Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams 2009, The Craft of Research, Third Edition, 3rd Ed., University of Chicago Press [ISBN: 9780226065663] | | |
| | | Justin Zobel 2004, <i>Writing for Computer Science</i> , Taylor & Francis [ISBN: 1-85233-802-4] | | |
| | | Claes Wohlin 2000, <i>Experimentation in Software Engineering</i> , Springer [ISBN: 0-7923-8682-5] | | |
| | | Douglas C. Montgomery 1997, Design and analysis of experiments, John Wiley & Sons [ISBN: 0471157465] | | |
| | | Janet Susan Milton,Jesse C. Arnold 2003, Introduction to probability and statistics, McGraw-Hill Science/Engineering/Math [ISBN: 007246836X] | | |
| Article/Paper List | Reference Article/Paper Resources | H"ofer and W. F. Tichy 2007, Status of empirical research in software engineering,", Lecture Notes in Computer Science | | |
| | | M. Shaw 2002, What makes good research in software engineering?", International Journal on Software Tools for Technology Transfer (STTT), 4, 1 | | |
| | | S. Hanenberg, 2010, Faith, hope, and love: an essay on software science's neglect of human factors,, SIGPLAN Notices, 45 | | |
| Other References | This Course does not have any other resources | | | |

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