UNIVERSITI TEKNOLOGI MARA
CSC784: RESEARCH METHODS IN COMPUTER SCIENCES

Course Name (English)	RESEARCH METHODS IN COMPUTER SCIENCES APPROVED
Course Code	CSC784

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

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, *Mathematical and Computational Modeling*, Wiley [ISBN: 1118853989] • Ronald S. King 2012, *Research Methods for Information Systems*, Mercury Learning & Information [ISBN: 1936420120] • Christina Silver,Ann Lewins 2014, *Using Software in Qualitative Research*, 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, *Writing for Computer Science*, Taylor & Francis [ISBN: 1-85233-802-4] • Claes Wohlin 2000, *Experimentation in Software Engineering*, 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	