COURSE INFORMATION

School/Faculty:	Computing/Engineering		Page:	1 of 5
Program name:	Master of Science (Data Science)			
Course code:	MCST1043		**Academic Session/Semester:**	2024-2025/2
Course name:	Research Design and Analysis in Data Science		**Pre/co requisite (course name and code, if applicable):**	
Credit hours:	3			

Course synopsis	This course will cover the fundamental steps and implementation on developing the initial ideas to formal academic writing accordingly. Students will be given the mechanisms on how to transform and digest the literature reviews that leads to the proposed title. The theoretical and practical aspects of implementing draft project proposal will be the milestone of this course. Ordered, Critical and Reasoning Exposition of knowledge through students efforts.			
Course lecturer(s)	**Name**	**Office**	**Contact no.**	**E-mail**
	Assoc Prof Dr Mohd Shahizan Othman	N28a	0127363269	shahizan@utm.my y

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO (Code)	*Taxonomies and **generic skills	T&L methods	***Assessment methods
CLO1	Construct specific procedures or techniques to evaluate a study's overall validity and reliability.	PLO1 PLO2	C6	Lecture, active learning	PR
CLO2	Present research problem from research papers.	PLO5 PLO4	CS3	Lecture, active learning	PR
CLO3	Design suitable techniques or methodology or the proposed research.	PLO3 PLO5	C6, TS3	Lecture, Active Learning, Project based learning	PR
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement ***T – Test; Q – Quiz; HW – Homework; Asg – Assignment; PR – Project; Pr – Presentation; F – Final Exam etc.					

Prepared by: Name:	Certified by:
Signature:	Name:
Date:	Signature:
	Date:

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Details on Innovative T&L practices:

No.	Type	Implementation
1.	Active learning	Conducted through in class activities such case study discussion site visit
2.	Project-based learning	Conducted through individual project. Students are required to write a research proposal.

Weekly Schedule:

Week 1-2	**1.0 INTRODUCTION TO RESEARCH PROJECT** 1.1 Definition of Research 1.2 Research Projects in Computing 1.3 How to choose research titles 1.4 Potential Research Titles
Week 3	**2.0 LITERATURE REVIEW Part 1** 2.1 Literature Review on the areas to be research. 2.2 Narrowing down the proposed research by identifying the keywords 2.3 A strategy to elaborate LR
Week 4	**3.0 LITERATURE REVIEW Part 2** 3.1 What should be included in LR? 3.2 How to read research papers statement 3.3 How to cite and write references 3.4 Writing abstract
Week 5	**4.0 PROBLEM FORMULATION** 4.1 Problem Background Analysis 4.2 Formulating Problem Statement based on Problem Background 4.3 Writing research objectives and scopes based on problem background and problem statement.
Week 6	**5.0 METHODOLOGY Part 1** 5.1 What is Research Design/Research Methodology 5.2 Formulating Research Design/Research Plan 5.3 Exploring & Conducting Existing Methods/Algorithm
Mid Semester break	

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Week 7	**6.0 METHODOLOGY Part 2** 6.1 Research Instruments 6.2 Performance Measures for Quantitative Research 6.3 Testing and Validation 6.4 Techniques in Qualitative Research, Survey Research, Case Study
Week 8	**7.0 ACADEMIC WRITING** 7.1 Writing Research Report 7.2 Research Report Format 7.3 Practices in Research Report Writing
Week 9	**8.0 ETHICS OF ACADEMIC WRITING & PRESENTATION** 8.1 How to avoid plagiarism 8.2 How to cite references 8.3 How to present references 8.4 Presentation Preparation
Week 10	Chapter 4: Expected Output and Conclusion
Week 11	**9.0 RESEARCH PROPOSAL WRITING (review)**
Week 12 & 13	**Self-Study**
Week 14	Proposal Presentation and Report Submission − Chapter 1 Introduction − Chapter 2 LR − Chapter 3 RM − Chapter 4 Expected Output and Conclusion
	Revision Week
	FINAL EXAM (no final exam for this course)

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Team work, Communication

Student learning time (SLT) details:

Distribution of student Learning Time (SLT) Course content outline	Teaching and Learning Activities						TOTAL SLT
	Guided Learning (Online Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	**L**	**T**	**P**	**O**			
CLO1	10h			4h	15h	10h	**39h**

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CLO2	10h			4h	15h	10h	**39h**
CLO3	10h			4h	17h	11h	**42h**
Total SLT	**30h**			**12h**	**47h**	**31h**	**120h**

	Continuous Assessment	PLO	Percentage	Total SLT
1	Project – Phase 1	PLO2	20	As in CLO1 – (7 h)
2	Project – Phase 2	PLO4	20	As in CLO2 – (7 h)
3	Project – Phase 3	PLO3	20	As in CLO3 – (7 h)
5	Final Project (Assignment 4)	PLO5	40 (20+20)	As in CLO3– (10 h)
	Final Assessment		Percentage	Total SLT
	Grand Total		**100**	**120h**

L: Lecture, T: Tutorial, P: Practical, O: Others

Special requirement to deliver the course (e.g: software, nursery, computer lab, simulation room):

None

Learning resources:

Text Book (if applicable)
Main references
Creswell, J. W. *Research design:* Qualitative, quantitative and mixed methods approaches. 5th Ed. Thousand Oaks, CA: Sage, 2018. ISBN: 978-1-5063-8670-6
Additional Reference
TRU Library. *APA Citation Style - Quick Guide*. 6th edition. 2011.
Type: Online Guide

https://github.com/drshahizan/research-design
http://elearning.utm.my

Academic honesty and plagiarism: *(Below is just a sample)*

Copying of work from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

Other additional information (Course policy, any specific instruction etc.):

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Disclaimer:

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