COURSE INFORMATION

School/Faculty:	Computing/Engineering	**Page:**	1 of 5
Program name:	Master of Science (Data Science)		
Course code:	MCDS1043/MECD1043(new code)	**Academic Session/Semester:**	20232024-2
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 coordinator	Associate Professor Dr Roliana Ibrahim			
Course lecturer(s)	**Name**	**Office**	**Contact no.**	**E-mail**
	Assoc Professor Dr Roliana Ibrahim	N28a room 02-32-01	01237376124	roliana@utm.my
	Assoc Prof Dr Mohd Shahizan Othman		0127363269	shahizan@utm.my

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	Progress1
CLO2	Present research problem from research papers.	PLO5, PLO4	CS3	Lecture, active learning	Progress2
CLO3	Design suitable techniques or methodology or the proposed research.	PLO3, PLO5	C6, TS3	Lecture, Active Learning, Project based learning	SLR Article, Proposal

Prepared by: Name: Signature: Date:	Certified by: Name: 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 **(Online)** (17-21 Mac 2024) (24-28 Mac 2024)	**1.0 INTRODUCTION TO RESEARCH PROJECT** 1.1 Definition of Research 1.2 Categories of Research Project 1.3 Evidence of Social Research 1.4 Scientific Method 1.5 Steps in Research Process
	2.0 LITERATURE REVIEW 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 2.4 What should be included in LR? 2.5 How to read research papers statement. 2.6 How to cite and write references 2.7 Writing abstract Exercise 1 - Gather references for LR
Week 3 **(Online)** (31Mac - 4 Apr 2024)	**3.0 PROBLEM FORMULATION** 3.1 Problem Background Analysis 3.2 Formulating Problem Statement based on Problem Background 3.3 Writing research objectives and scopes based on problem background and problem statement.
	4.0 METHODOLOGY Part 1 4.1 What is Research Design/Research Methodology 4.2 Formulating Research Design/Research Plan Exploring & Conducting Existing Methods/Algorithm Exercise 2: One page proposal on title, synopsis, and major reference.
Week 4 **(Online)** 7 - 11 Apr 2024 * Eidul-Fitri (10-11 Apr)	**4.0 METHODOLOGY Part 2** 4.1 Research Instruments 4.2 Performance Measures for Quantitative Research 4.3 Testing and Validation 4.4 Techniques in Qualitative Research, Survey Research, Case Study
Week 5 **(Online)** (14 -18 Apr 2024)	**5.0 ACADEMIC WRITING** 5.1 Writing Research Report 5.2 Research Report Format 5.3 Practices in Research Report Writing

	6.0 **ETHICS OF ACADEMIC WRITING & PRESENTATION** 6.1 How to avoid plagiarism. 6.2 How to cite references. 6.3 How to present references. 6.4 Presentation Preparation Exercise 3: one page example of research framework diagram
Week 6 (21 -25 Apr 2024)	**7.0 Systematic Literature Review Using AI Part 1 (Hands On)** Progress 1 (submit brief proposal synopsis and references) 5 pages -Selecting Topic for Research Proposal
Week 7 (28 -2 May 2024) *Labour Day (1 May)	**8.0 Systematic Literature Review Using AI Part 2 (Hands On)**
Week 8 (5 May - 11 May 2024)	**Semester Break**
Week 9 12-16 May 2024)	**9.0 Systematic Literature Review Using AI Part 3 (Hands On)** Progress 1 - (submit collections of references for LR)
Week 10 19 - 23 May 2024)	**10 Systematic Literature Review Using AI Part 4 (Hands On)**
Week 11 (26 - 30 May 2024)	**Self Study**
Week 12 (2-6 Jun 2024)	**11 SLR ARTICLE WRITING (review)** Progress 2 (Draft SLR article)
Week 13 : (9-13 Jun 2024)	**12 RESEARCH PROPOSAL WRITING (review)** Progress 2 (Draft of your proposal) Chapter 1 Introduction Chapter 2 LR
Week 14 16-20 Jun 2024)	**Self-Study**
Week 15 (23-27 Jun 2024)	Proposal Presentation and Report Submission (20-30 pages) Chapter 1 Introduction Chapter 2 Literature Review Chapter 3 Methodology Chapter 4 Conclusion
Week 16 30 Jun - 6 July)	**Revision Week**
Week 17-19	**FINAL EXAM (no final exam for this course)**

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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	Guided Learning (Online Face to Face)				Teaching and Learning Activities		TOTAL SLT
					Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	**L**	**T**	**P**	**O**			
CLO1	10h			4h	15h	10h	**39h**
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	Progress 1	PLO1,PLO2	15(10+5)	As in CLO1 – (7 h)
2	Progress 2	PLO4, PLO5	15 (10+5)	As in CLO2 – (7 h)
3	SLR Article	PLO3	30	As in CLO3 – (7 h)
5	Project Proposal	PLO5	40	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
This course can be conducted physical face to face, or online face-to-face due to the number of students only 9. During MCO/PKP, lecture and presentation are conducted face to face using zoom, webex or skype with participation with all students.

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
Online
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: