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:**	20242025-1
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	Assoc Prof Dr Mohd Shahizan Othman			
Course lecturer(s)	**Name**	**Office**	**Contact no.**	**E-mail**
	Assoc Prof Dr Mohd Shahizan Othman	N28a Room 02-10-01	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	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

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

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Course name:	Research Design Analysis in Data Science	**Pre/co requisite (course name and code, if applicable):**	
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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 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	**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	**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	**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	**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	**8.0 Systematic Literature Review Using AI Part 2 (Hands On)**
Week 8	**Semester Break**
Week 9	**9.0 Systematic Literature Review Using AI Part 3 (Hands On)** Progress 1 - (submit collections of references for LR)
Week 10	**10 Systematic Literature Review Using AI Part 4 (Hands On)**
Week 11	**Self Study**
Week 12	**11 SLR ARTICLE WRITING (review)** Progress 2 (Draft SLR article)
Week 13	**12 RESEARCH PROPOSAL WRITING (review)** Progress 2 (Draft of your proposal) Chapter 1 Introduction Chapter 2 LR
Week 14	**Self-Study**
Week 15	Proposal Presentation and Report Submission (20-30 pages) Chapter 1 Introduction Chapter 2 LR Chapter 3 RM Chapter 4 Initial findings and Conclusion
Week 16	**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: Guided Learning Non-Face to Face	Teaching and Learning Activities: Independent Learning Non-Face to face	TOTAL SLT
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	PLO2	15(10+5)	As in CLO1 – (7 h)
2	Progress 2	PLO4	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

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

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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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REVIEW OF L&T ACTIVITIES TO INCLUDE ONLINE LEARNING						
Course learning outcome	**Guided Learning FTF hours (from CI)**	**Guided Learning FTF hours completed**	**Online Learning hours**			
			Activities	**Type of time spent**	**Estimated time**	**Total time**
CLO1: Apply knowledge in data governance principles to present a comprehensive view of work and behaviour required to implement data governance in an organization.	10		5			
			Live Interaction with students	The time spent in synchronous live interaction	90 minutes	90 minutes
			Students read ten a 5-page article online	The time required to consume content	2 mins x 50 pages	100 minutes
			Students carry out learning task in eLearning forums for the given activities	The time required to read the eLearning forum instructions	2 mins x 5 forums	10 minutes

			Students reply to the eLearning forum exercises	Time spent for instructional activities	10 mins x 5 forums	50 minutes
			Live Interaction with students to discuss students' forum responds	The time spent in synchronous live interaction	30 minutes	30 minutes
			Students spent time on averagely 5 screens for all the activities	The average time on 'screen' and the number of screens viewed.	5 mins x 2 screens	20 minutes
CLO2: Analyse critically and creatively data governance elements based on a simulated or a real-world organization case.	10		*5*			
			Live Interaction with students	The time spent in synchronous live interaction	90 minutes	90 minutes
			Students read ten a 5-page article online	The time required to consume content	2 mins x 50 pages	100 minutes
			Students carry out learning task in eLearning forums for the given exercises	The time required to read the eLearning forum instructions	2 mins x 5 forums	10 minutes
			Students reply to the eLearning forum exercises	Time spent for instructional activities	10 mins x 5 forums	50 minutes
			Students spent time on averagely 5 screens for all the activities	The average time on 'screen' and the number of screens viewed.	5 mins x 6 screens	30 minutes
			Live Interaction with students to discuss students' forum responds	The time spent in synchronous live interaction	20 minutes	20 minutes
CLO3: Design a business use case for data governance program proposal and demonstrate responsibility in delivering the project	10		5			

in a professional and ethical manner.						
			Live Interaction with students	The time spent in synchronous live interaction	80 minutes	80 minutes
			Students read ten a 5-page article online	The time required to consume content	2 mins x 50 pages	100 minutes
			Students carry out learning task in eLearning forums for the given exercises	The time required to read the eLearning forum instructions	2 mins x 5 forums	10 minutes
			Students reply to the eLearning forum exercises	Time spent for instructional activities	10 mins x 5 forums	50 minutes
			Live Interaction with students to discuss students' forum responds	The time spent in synchronous live interaction	30 minutes	30 minutes
			Students spent time on averagely 5 screens for all the activities	The average time on 'screen' and the number of screens viewed.	5 mins x 6 screens	30 minutes

REVIEW OF ASSESSMENT PLAN				
Before (from CI)		**Revised***		
Continuous Assessment			Percentage	Total SLT
1	Assignment 1		20	**30 m**
2	Assignment 2		20	**30 m**
Summative Assessment			Percentage	

** All CLO should be maintained but changes can be made on the type of assessment. If changes have been made on the assessment type which affects the SLT, please adjust the SLT in the CI accordingly.*