



# *Teaching Portfolio*



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## 1. Teaching Philosophy

As introduction, I would love to express the *Falsafah Pendidikan Kebangsaan* or National Education Philosophy of teaching which encompass the needs and souls of teaching. Quoted in the written Bahasa Melayu:

*“Falsafah Pendidikan di Malaysia adalah suatu usaha berterusan ke arah memperkembangkan lagi **potensi individu secara menyeluruh** dan bersepadu untuk mewujudkan **insan yang seimbang dan harmonis** dari segi **intelekt, rohani, emosi dan jasmani** berdasarkan kepercayaan dan **kepatuhan kepada Tuhan**. Usaha ini adalah bagi melahirkan rakyat Malaysia yang berilmu **pengetahuan, berketerampilan, berakhlak mulia, bertanggungjawab** dan berkeupayaan mencapai **kesejahteraan diri, serta memberi sumbangan** terhadap keharmonian dan kemakmuran keluarga, masyarakat dan negara.”*

*Falsafah Pendidikan Kebangsaan*

Rooted in that philosophy I am aspiring to further develop individuals in a holistic manner with a purpose of prospering people lives *in the Name of God for Mankind* (“*Kerana Tuhan untuk Manusia*”)

My philosophy consists of four components; One is to **teach through action** where the best way of teaching and learning is through action. Second is to **learn with passion** where learners should embrace the knowledge instead pushed to grasp the knowledge. Third is to **teach people**, not the syllabus nor the content. Here I would emphasise on the person development throughout the teaching-learning process rather than the content or the structure. Finally, **learn to lead** whereby the learners can lead with the gained knowledge and skills to further themselves in pursuit of prospering their lives.

It is a never-ending learning journey of a learner-teacher as each given lesson, both, the students, and I will learn something new which I would love to conclude with a verse from the Quran:

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*“My Lord! Advance me in Knowledge”*

*(Quran : Ta-Ha; 20 : 114)*

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Amin.

## 2. Teaching Responsibilities

My first experience of teaching when I was a 2<sup>nd</sup> year student back in year 2000, teaching Microsoft Word and Excel to the first-year students. At that time, not many UTM students has the experience of using computers, especially for those from the low-income group and rural background. I found it was really satisfying sharing my knowledge that can improve individual lives.

My academic career begins as a tutor at Faculty of Computer Science and Information System (now known as School of Computing) in 2007. I was appointed during my final semester of my Master of Science Computer Science study. As a tutor, I was responsible to conduct lab sessions on Web Programming and Multimedia Development. Early 2008, I was appointed as a lecturer. At the end of 2008, I proceed my academic career by pursuing PhD degree at the Swansea University, where I also received Postgraduate Teaching Certificate from Swansea University. After graduation in 2014, I was promoted to Senior Lecturer at the now known as School of Computing UTM.

My academic background formed from various sub fields of Computer Science. I was major in Computer Networks and Communication for my BSc Computer Science. I did My MSc Computer Science by merging computer network skills with Artificial Intelligence (AI), research in optimizing web caching with neural network. My master work has been used by local MSC status company and won international award. From there, understanding the importance of visual analytics, I pursue my PhD in Computer Science on data visualization.

These diverse understanding of computer science knowledges, allowed me to apply and adapt my knowledge for the benefits of each subject taught especially in the Human Computer Interaction (HCI) and Data Visualization.

As an academician, postgraduate and undergraduate supervisions are important. To date, I am supervising 8 (5 main, 3 co-supervision) PhD students, and 1 master by research students while I have graduated 1 PhD and 4 master graduates. Each year I will supervise around 3 to 6 undergraduate students for their final year projects (FYP) which has led to 14 graduates completed their study under my FYP supervision. Align with *teach to lead*, each of the supervision is tailored and balanced accordingly with their passion and objectives either on research, development, innovation, and even entrepreneurship.

### 3. Teaching Methodology

*“You cannot teach a man anything, you can only help him discover it within himself”*

**Galileo Galilei**

My teaching methodology emphasises on the students’ experience which allow them to use the knowledge beyond the classroom or lab. The methodology will adapt either the pedagogy or andragogy; or the current approaches of heutagogy, peeragogy and cybergogy accordingly to the situations.

Further, the classes are incorporated with learning tools such as problem-based learning and in-class activities. Most of the case studies introduced in the class are either fundamental cases or recent real-world problems. To continuously engage with the students, interactivity is also incorporated with the current trends and settings which they are involved. These approaches will allow interests from the students and encourage discoveries.

The teaching materials and real-world problems are in tandem with my research interests and industrial experience that allow me to go broad or in depth and package them for the teaching-learning session.

A sustainable methodology could not be completed without a good reflection, which is summarised at the end of each semester, by reflecting into improvements in teaching style, content development, and even interpersonal skills.

### 4. Efforts to Improve Teaching

As the saying;

*“Everyone has a plan, until they get punched in the face”*

**Mike Tyson**

In becoming a future ready educator, I believe in a continuous improvement of teaching, either in the pedagogy or the content of the teaching. When Covid-19 pandemic arrives, there were no other option for the learners and teachers but to be agile and to quickly adapt. On the bright side, the pandemic struck as an opportunity for me to apply new approaches in teaching and learning.

A good balance of strong fundamental knowledge and the agility on the content, platform and approach allowed each course to be fresh each time it being taught. Focusing on the people and riding the trend wave allow me to synchronise the lessons with the learners.

Other than social media and online active learning tools such as the Mentimeter and the Kahoot platforms, my efforts of improving my teaching span through my research work, professional involvements in IEEE and ACM societies, industrial and community linkages. These experiences and knowledge are gradually shared throughout the lessons.

One of my latest efforts in improving my teaching is transforming the lab-dependent, face-to-face class to an online, cloud-based computing class, which I coined as “My four ingredients in teaching and learning programming throughout the lockdown”

<https://youtu.be/Ec9jBzlt6yY>

## 5. Teaching Goals

**Short term goal** – To educate and provide knowledge to the learners through different medium and platforms. Allowing the learners to be motivated and apply the knowledge in their works.

**Long term goal** – To work together among the colleagues to be a reference in the respected field of knowledge and able to share, guide and advance the knowledge to be use for the wellbeing of the society.

## 6. Courses Taught

Courses Information for the Human Computer Interaction (HCI) and Data Visualisation can be found at the [Appendix A](#) and [Appendix B](#). The list of courses taught are as follows:

Semester	Sem	Subject Code	Subject	Credit Hour
202020212	2	SCSV4233	Data Visualisation	3
202020211	1	SECV2113	Human Computer Interaction	3
201920202	2	SCSV4233	Data Visualisation	3
201920201	1	SCSV2113	Human Computer Interaction	3
201820192	2	SCSV2113	Human Computer Interaction	3
201820191	1	SCSV4233	Data Visualisation	3
201720182	2	SCSV2113	Human Computer Interaction	3
201720181	1	SCSV4233	Data Visualisation	3
201620172	2	SCSV2113	Human Computer Interaction	3
201620171	1	SCSV4233	Data Visualisation	3
201520162	2	SCSJ3032	Final Year Project 1	2
201520162	2	SCSV4134	Final Year Project 2	4
201520161	1	SCSV4233	Data Visualisation	3
201420152	2	SCSJ3032	Final Year Project 1	2
201420152	2	SCSV4134	Final Year Project 2	4
201420151	1	SCSV4233	Data Visualisation	3
201320142	2	SCSV4233	Data Visualisation	3
201320141	1	SCK3633	Web Programming	3
201320141	1	SCV3114	Industrial Training	4
201320141	1	SCSV2113	Human Computer Interaction	3
201320141	1	SCV3118	Industrial Training	8
201320141	1	SCV4134	Final Year Project 2	4
201220132	2	SCV4233	Data Visualisation	3
201220132	2	SCSJ1023	Programming II	3
201220132	2	SCJ1023	Programming II	3
201220131	1	SCV4533	Data Visualisation	3
201120122	2	SCSV1223	Web Programming	3
201120122	2	SCV1223	Web Programming	3
201120121	1	SCV4533	Data Visualisation	3
			<b>Total Credits</b>	<b>94</b>

## 7. Summary of Teaching Innovations

The following are some of the recent talks and resources related to my teaching innovations. I was delighted to share my thoughts to UIAM students on Mobile Application Development and honoured to share my thought on teaching during the pandemic by the UTMLead.

- Beyond UTM classroom – Teaching “**Mobile Application Development Process**” for UIAM students: <https://www.youtube.com/watch?v=lTrC3gtwYQs>
- Sharing session for OLC Teaching series by UTMLead – Title: “**My four ingredients in teaching and learning programming throughout the lockdown**”:  
<https://youtu.be/Ec9jBzIt6yY>
- Link to my YouTube Tutorial Channel:  
[https://www.youtube.com/channel/UCIx\\_a73iDuDLISEvWafHivQ](https://www.youtube.com/channel/UCIx_a73iDuDLISEvWafHivQ)
- Link to my GitHub repository: <https://github.com/farhanmo?tab=repositories>



## 8. Supervision – Postgraduate (as of September 2021)

1	Muhammad Shamsul Alam	SK	PCSS3	SUPERVISOR
2	Chan Vei Siang	SK	PCSS3	SUPERVISOR
3	Karrar Neamah Hussein	SK	PCSS3	SUPERVISOR
4	Karrar Abdulameer Kadhim Zahid	SK	PCSS3	SUPERVISOR
5	Zaid Nidhal Khudhair	SK	PCSS3	SUPERVISOR
6	Muhammad Ismail Bin Mat Isham	SK	MCSS3	SUPERVISOR
7	Abraheem Mohammed Sulayman Alsubayhay	SK	PCSS3	CO-SUPERVISOR
8	Nurulazirah Binti Md Salih @ Mohd Salleh	SKBSK	PMBE3	CO-SUPERVISOR
9	Mohd Khalid B Mokhtar	SK	PCS	CO-SUPERVISOR

## 9. Graduated Postgraduate Students

1	MCS141009	Mohd Shahrizan Bin A Wahab	2016	Master
2	MC122052	Abdullah Abdulhameed Ahmed	2017	Master
3	MMB143007	Nor Nisha Nadhira Binti Nazirun	2018	Master
4	MCS173004	Chan Vei Siang	2020	Master
5	PC123082	Yusman Azimi Bin Yusoff	2020	PhD

## 10. Summary of Teaching Evaluations

Students' teaching evaluations and comments are listed in [Appendix C](#). These evaluations and comment are substantial as reference in the continuous improvement of the teaching approaches.

## 11. Students Development

University should not be just a place for learning new knowledge but also a place to develop individuals holistic as whole. Co-curricular activities play important role in building students' character and personality. I am proud to be the advisor of the Computer Graphics and Multimedia Association (CGMA), a student association under Department of DVC Students Affairs from 2016 to 2018. The co-curricular activities conducted allow students to increase their interpersonal skills and improve other skills which were not taught in their courses.

Entrepreneurship also builds up students' character. I am also an avid proponent of teaching entrepreneurship to students. My experience learning from the best at the Stanford University and the Oxford University drove me to share the knowledge, promoting innovations, start-ups and led hackathon activities such as the WhatdeHack hackathon.

Link to the WhatdeHack Closing Promo: [https://youtu.be/dry\\_LDfXGiA](https://youtu.be/dry_LDfXGiA)

## 12. Teaching and Learning Awards

Below are the teaching and learning awards received throughout my academic career up to today.

2020	:	<i>Gold Medal, New Academia Learning Innovation (NALI) 2020 – Virtual Reality Welding Simulation Kit for Learning and Acquiring Welding Psychomotor Skills</i>
2018	:	<i>Gold Medal, New Academia Learning Innovation (NALI) 2018 – Mobile Tangilbe Edutainment Games for Kids Education</i>
2020-2021	:	<i>Award of Excellence – Active Blender Learning Course for Human Computer Interaction</i>
2019-2020	:	<i>Award of Excellence – Active Blender Learning Course for Data Visualisation</i>
2018-2019	:	<i>Award of Excellence – Active Blender Learning Course for Data Visualisation</i>
2017-2018	:	<i>Award of Excellence – Active Blender Learning Course for Data Visualisation</i>
2014	:	<i>Certificate of Appreciation for UTM E-learning – One of the most active e-learning lecturer in Universiti Teknologi Malaysia 2014</i>
2012 – 2013	:	<i>Certificate of Appreciation for UTM E-learning – One of the most active e-learning lecturer in Universiti Teknologi Malaysia 2012 – 2013</i>

## Appendix A

### Course Information – Human Computer Interaction (HCI)

## COURSE INFORMATION

<b>School/Faculty:</b>	Computing/Engineering	<b>Page:</b>	13 of 25
<b>Program name:</b>	Bachelor of Computer Science (Software Engineering)		
<b>Course code:</b>	SCSV2113	<b>Academic Session/Semester:</b>	2018/19/2
<b>Course name:</b>	Human-Computer Interaction	<b>Pre/co requisite (course name and code, if applicable):</b>	Nil
<b>Credit hours:</b>	3		

**Course synopsis**  
This course will introduce students to human-computer interaction theories and design processes. The emphasis will be on applied user experience (UX) design. The course will present an iterative evaluation-centered UX lifecycle and will introduce a broader notion of user experience, including usability, usefulness, and emotional impact. The lifecycle should be viewed as template intended to be instantiated in many different ways to match the constraints of a particular development project. The UX lifecycle activities we will cover include contextual inquiry and analysis, requirements extraction, design-informing models, design thinking, ideation, sketching, conceptual design, and formative evaluation.

**Course coordinator (if applicable)**  
Assoc. Prof. Dr. Masitah Ghazali

<b>Course lecturer(s)</b>	<b>Name</b>	<b>Office</b>	<b>Contact no.</b>	<b>E-mail @utm.my</b>
	Nor Anita Fairis Ismail (01, 06)			noranita
	Dr. Nur Zuraifah Syazrah Othman (02, 07)			zuraifah
	Assoc. Prof. Dr. Nor Azman Ismail (03)			azman
	Dr. Farhan Mohamed (04)			farhan

**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	Apply the concept of human-computer interaction and the application of human factors as a multi-level process of communication through UX design and evaluation of interactive systems.	PLO1 (KW)	C3	Lecture, active learning	A, F
CLO2	Apply the theoretical knowledge to issues that arise in the design of interactive systems.	PLO3 (PS)	C3	Lecture, Project-based learning	GR, F
CLO3	Build a prototype development project according to principles and guidelines of human-computer interaction.	PLO5 (TH)	P3 TH1, TH3	Project-based learning	GR
CLO4	Ability to act responsibly in carrying out tasks throughout the project life cycle	PLO9 (GC)	A6 GC4	Project-based learning	PA
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement *** L – Lecture; T – Tutorial; TE – Test ; PS – Problem Solving; PR – Project ; F – Final Exam					

**Details on Innovative T&L practices:**

No.	Type	Implementation
1.	Active learning	Conducted through in-class activities
2.	Project-based learning	Conducted through building a prototype. Tasks are given in sequential steps throughout the semester. Students in a group of 3 are asked to build a prototype in order to solve a challenge faced by users that require HCI and UX knowledge in order to deliver a good apps or systems. The report must comply to the project specifications and be given in the form of written report.

#### Weekly Schedule:

W 1 8/9 – 12/9	<p>Introductory to Course</p> <p>Introduction to Human Computer Interaction</p> <ul style="list-style-type: none"> <li>• Good and poor design</li> <li>• Interaction design vis-à-vis human-computer interaction</li> <li>• User experience and usability</li> <li>• The process of interaction design</li> <li>• Interaction design and the user experience</li> </ul>
W 2 15/9 – 19/9	<p><u>Section A: Human Behaviour</u></p> <p>Users: cognition aspects, emotional and social interactions</p> <ul style="list-style-type: none"> <li>• Cognition aspects</li> <li>• Emotional interactions</li> <li>• Social interactions</li> </ul>
W3 22/9 – 26/9	Users: cognition and emotion (cont.)
W 4 29/9 – 3/10	<p>Conceptualising Interaction Design</p> <ul style="list-style-type: none"> <li>• Understanding the problem space</li> <li>• Conceptualising the design: <ul style="list-style-type: none"> <li>• conceptual models</li> <li>• metaphors and analogies</li> <li>• interaction types</li> </ul> </li> </ul>
W 5 6/10 – 11/10	<p>Trends in Interfaces</p> <ul style="list-style-type: none"> <li>• Interfaces types</li> </ul>
W 6 13/10 – 17/10	<p><u>Section B: Design</u></p> <p>The Interaction Design Process &amp; Practice</p> <ul style="list-style-type: none"> <li>• Involving users in development</li> </ul>

	<ul style="list-style-type: none"> <li>Principles of user-centred approach</li> <li>Four basic activities in interaction design</li> <li>Practical issues</li> <li>AgileUX</li> </ul>
W 7 20/10 – 25/10	<p>Establishing Requirements</p> <ul style="list-style-type: none"> <li>Importance of requirements</li> <li>Data gathering techniques</li> <li>Data interpretation and analysis</li> </ul>
W 8 27/10 – 31/10	MID SEMESTER BREAK ( <b>27-31 October 2019</b> )
W 9 3/11 – 7/11	<p>Establishing Requirements (cont.)</p> <ul style="list-style-type: none"> <li>Task description: scenarios, use case</li> <li>Task analysis: HTA</li> </ul>
W 10 10/11 – 14/11	<p><u>Section C: Implementation</u></p> <p>Design, Prototyping and Construction</p> <ul style="list-style-type: none"> <li>Prototyping and construction</li> <li>Conceptual design</li> <li>Concrete design <ul style="list-style-type: none"> <li>Gestalt Principle</li> </ul> </li> <li>Scenarios in design</li> <li>Prototypes in design (storyboard, card-based)</li> <li>Construction: physical computing, SDK</li> </ul>
W 11 17/11 – 21/11	Design, Prototyping and Construction (cont.)
W 12 24/11 – 28/11	<p><u>Section D: Evaluation</u></p> <p>Introducing Evaluation</p> <ul style="list-style-type: none"> <li>Why, what, where and when of evaluation</li> <li>Evaluation approaches and methods</li> </ul>

	<ul style="list-style-type: none"> <li>• Inspection (heuristic evaluation, walkthrough)</li> <li>• Analytics</li> <li>• Predictive model (Fitts' Law)</li> </ul> <p>*Low-fidelity Prototypes v1 Evaluation</p>
W 13 1/12 – 5/12	<p>Other Evaluations Types</p> <ul style="list-style-type: none"> <li>• Evaluation case studies</li> </ul> <p>How to: usability test, experiment, field studies</p> <p>*Low-fidelity Prototypes v2 Evaluation – test with users outside classroom</p>
W 14 8/12 – 12/12	<p>Data Analysis, Interpretation and Presentation</p> <ul style="list-style-type: none"> <li>• Simple quantitative analysis</li> <li>• Simple qualitative analysis</li> <li>• Tools to support data analysis</li> </ul> <p>*Presenting the findings</p>
W 15 20/12	Project Presentation / HCI Day
W 16 - 18	REVISION WEEK (22/12 - 26/12) AND FINAL EXAM

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

Applying UX Design practice  
 Building prototyping (low and medium fidelity)  
 Performing usability testing  
 Team working

**Student learning time (SLT) details:**

Distribution of student Learning Time (SLT) Course content outline					Teaching and Learning Activities		TOTAL SLT
	Guided Learning (Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	L	T	P	O			
CLO 1	23h	4h				8h	35h
CLO 2	4h		5h		5h	44h	58h
CLO 3	1h			2h	7h	8h	18h
CLO 4				3h			3h
<b>Total SLT</b>	<b>28h</b>	<b>4h</b>	<b>5h</b>	<b>5h</b>	<b>12h</b>	<b>60h</b>	<b>114h</b>

Continuous Assessment	PLO	Percentage	Total SLT
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1	Assignment 1	PLO1	5	As in CLO 1 (24h)
2	Assignment 2	PLO1	5	As in CLO 1 (24h)
3	Assignment 3	PLO1	5	As in CLO 1 (24h)
4	Assignment 4	PLO1	5	As in CLO 1 (24h)
5	Project: Part 1	PLO3	5	As in CLO 2 (36h)
6	Project: Part 2	PLO3	10	As in CLO 2 (36h)
7	Project: Part 3	PLO3	5	As in CLO 2 (36h)
8	Project: Part 4	PLO3, PLO5	25	As in CLO 2 (36h) & CLO 3 (18h)
<b>Final Assessment</b>			<b>Percentage</b>	<b>Total SLT</b>
1	Peer Assessments	PLO9	5	3
2	Final Exam	PLO1, PLO3	30	3
<b>Grand Total</b>			<b>100</b>	<b>120h</b>

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

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

N/A

#### Learning resources:

##### Main references:

- i) Sharp, H., Rogers, Y., Preece, J., (2015) "Interaction Design: Beyond Human-Computer Interaction", 4th Edition, New York: J. Wiley & Sons.

##### Additional references:

- i) Baxter, Courage & Caine\_(2015), "Understanding Your Users"
- ii) MacKenzie, I.S. (2013), "Human-Computer Interaction: An Empirical Research Perspective", Morgan Kaufman.
- iii) Dix, A. et. al (2004), "Human-Computer Interaction", 3rd Edition, Prentice Hall.

##### Online

<http://elearning.utm.my>

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

Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES) Copying of work (texts, simulation results etc.) 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.):

No	Assessment	PLO1	PLO3	PLO5	PLO9	TOTAL
		CLO1	CLO2	CLO3	CLO4	
1	ASSIGNMENT (4)	20				20
2	PROJECT 1		5			5
3	PROJECT 2		10			10
4	PROJECT 3		5			5
5	PROJECT 4		10	15		25
6	PEER ASSESSMENT (4)				5	5
7	FINAL EXAM	10	20			30

	<b>TOTAL PLO</b>	<b>30</b>	<b>50</b>	<b>15</b>	<b>5</b>	<b>100</b>	
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**Disclaimer:**

All teaching and learning materials associated with this course are for personal use only. The materials are intended for educational purposes only. Reproduction of the materials in any form for any purposes other than what it is intended for is prohibited.

While every effort has been made to ensure the accuracy of the information supplied herein, Universiti Teknologi Malaysia cannot be held responsible for any errors or omissions.

## Appendix B

### Course Information – Data Visualisation

## COURSE INFORMATION

<b>School/Faculty:</b>	Computing/Engineering	<b>Page:</b>	20 of 25	
<b>Program name:</b>	Bachelor of Computer Science (Graphics & Multimedia Software)			
<b>Course code:</b>	SCSV4233	<b>Academic Session/Semester:</b>	2020/21-2	
<b>Course name:</b>	Data Visualisation	<b>Pre/co requisite (course name and code, if applicable):</b>	Nil	
<b>Credit hours:</b>	3			
<b>Course synopsis</b>	This course presents the theoretical and technical aspects of data visualization in various applications. It emphasises on the process of visualization, which include various data sources, reconstruction of data, data models and data model representation techniques. Real applications of data visualization such as used in medical, scientific, engineering, biotechnology and environment applications are also discussed.			
<b>Course coordinator (if applicable)</b>	Dr. Farhan bin Mohamed			
<b>Course lecturer(s)</b>	<b>Name</b>	<b>Office</b>	<b>Contact no.</b>	<b>E-mail @utm.my</b>
	Dr. Farhan Bin Mohamed			farhan
	Prof. Dr. Mohd Shafry Bin Mohd Rahim			shafry

### 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	Describe and reproduce the concept of data visualization in various applications.	PLO1 (KW)	C3, P3, A1	Lecture, Tutorial, Practical	A, FE
CLO2	Apply their theoretical and technical knowledge to formulate and discuss the solution to the issues that arise in the development of visualization systems.	PLO2 (TE)	C5, P2, A2	Lecture, Tutorial, Practical	PR, PD, FE
CLO3	Develop a prototype of visualization system according to principles and guidelines of data visualization through report writing and presentation by group.	PLO6 (SC)	C6, A5 SC1, SC3, TW1	Practical, Project-based learning	PR, PD, FE

Refer \*Taxonomies of Learning and \*\*UTM's Graduate Attributes, where applicable for measurement of outcomes achievement  
 \*\*\* L – Lecture; T – Tutorial; TE – Test ; PS – Problem Solving; PR – Project ; F – Final Exam

### Details on Innovative T&L practices:

No.	Type	Implementation
1.	Active learning	Conducted through in-class activities and tutorials
2.	Project-based learning	Conducted through software testing project assignments.

### Weekly Schedule:

Week 1	Module 1: Introduction to Data Visualization - Definition, Goals and History of Visualization - Component of Data Visualization System - Applications of Data Visualization
Week 2	Module 2: Principles of Visualization - Visualization Framework - Models, Colours, and Gestalt Theory
Week 3	Module 3: Visualization Pipelines - Data sources, Pipelines and Sources of Error
Week 4	<b>Module 4: Data Representation</b> - Domain and data values & Grid (unstructured, structure) - Scattered Data & Classifications Schemes
Week 5	<b>Module 5: Mapping Techniques</b> - Diagrams and Charts; Function plots and height fields - Isolines/Colour coding; Glyphs and icons
Week 6	<b>Module 7: Indirect Volume Visualization</b> - Scientific Visualisation introduction - Volume rendering pipeline; Marching cubes and Acceleration techniques
Week 7	<b>Module 8: Direct Volume Rendering</b> - Classification (transfer function, segmentation) - Volume shading and Slicing and Ray casting
Week 8	- Texture-based volume rendering
Week 9	<b>MID-SEMESTER BREAK (Module 6: VTK Setup)</b>
Week 10	<b>Module 9: Vector field visualization</b> - Basic math of vector fields - Arrow and glyphs; Particle tracing/Particle tracing on grids - Topology-based visualization & 3D vector fields
Week 11	<b>Module 10: Data Visualization in Scientific/Medical Application</b>
Week 12	<b>Module 11: Personal and Group Project Development &amp; Delivery</b>
Week 13	- Volume Visualization Application & Personal Project Presentation
Week 14	- Vector-based Visualization Application & Group Project Presentation
Week 15	<b>Summary</b>
W 16 - 18	<b>REVISION WEEK AND FINAL EXAM</b>

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

Team working Writing technical report
--

**Student learning time (SLT) details:**

Distribution of student Learning	Teaching and Learning Activities		TOTAL SLT
	Guided Learning	Independent Learning	

Time (SLT) Course content outline	(Face to Face)				Non-Face to Face	Non-Face to face	
	L	T	P	O			
<b>CLO</b>							
CLO 1	18h	10 h	10 h		4h	3h	<b>45h (48h)</b>
CLO 2	18h	10 h	12 h		4h	3h	<b>47h (60h)</b>
CLO 3			2h	4h	2h	1h	<b>9h (12h)</b>
<b>Total SLT</b>	<b>36h</b>	<b>20 h</b>	<b>24 h</b>	<b>4h</b>	<b>10h</b>	<b>5h</b>	<b>101h (120h)</b>

Continuous Assessment		PLO	Percentage	Total SLT (part of total SLT above)
1	Assignment 1	KW,TE	10	<b>2h</b>
2	Assingment 2	KW,TE	10	<b>2h</b>
3	Assignment 3	TE	10	<b>2h</b>
4	Personal Project	SC,TW	20	<b>5h</b>
5	Group Project	SC,TW	20	<b>5h</b>
Final Assessment			Percentage	Total SLT
1	Final Examination	KW	30	<b>3h</b>
<b>Grand Total SLT</b>				<b>120h</b>

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

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

Postgraduate Teaching Assistant (TA)  
Software: Visual Studio, VTK Library, Python, Tableau Desktop  
Hardware: PC / Cloud Computing

#### Learning resources:

##### Main references:

- Data Visualization: Principles and Practice, Second Edition, by Alexandru C. Telea, 2015.

##### Additional references:

- Data Visualization: The State of The Art, by Frits Post, Springer 2002

- Visual data Mining: Techniques and Tools for Data Visualization, by Ton Soukup et al, John Wiley & Sons, 2002

- Data Visualization Techniques by Bala Krishnamurthy, John Wiley & Sons, 1999

- Visualization Toolkit, An Object Oriented Approach by Will Schroeder, Ken Martin dan Bill Lorensen, John Willey and Sons, 1998.

- Scientific Visualization and Graphics Simulation by Thalmann D, John Willey and Sons, 1990

##### Online:

<http://elearning.utm.my>

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

Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES)  
Copying of work (texts, simulation results etc.) 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.):**

-

**Disclaimer:**

All teaching and learning materials associated with this course are for personal use only. The materials are intended for educational purposes only. Reproduction of the materials in any form for any purposes other than what it is intended for is prohibited.

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## Appendix C

### ePPP Students' Teaching Evaluations



## Student comments:

### 2020/2021 - 02

1. The lecturer is very good, the lesson is good. Everything is fine
2. No suggestions.
3. Best lecturer ever <3

### 2020/2021 - 01

1. Great
2. Lecturer relation with the student is great.
3. Creative person.

### 2019/2020 - 02

1. Nothing
2. Lecturer is good in delivering lectures even though via online teaching. The explanation is very detail and easy to understand.
3. Good
4. I gain more knowledge from this class

### 2019/2020 - 01

1. good lecturer
2. good
3. .
4. Very Good!

Seksyen : 04  
 Laporan Penilaian Pengajaran Pensyarah  
 Semester 1 Sesi 20192020

Bil. Responden : 33

Bil. Pelajar Mendaftar : 48

**A. Pengajaran**

Min Anda : 4.79  
 Min Fakulti : 4.45  
 Min Universiti : 4.55

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.85	0.00	0.00	0.00	15.15	84.85
2	4.79	0.00	0.00	3.03	15.15	81.82
3	4.82	0.00	0.00	0.00	18.18	81.82
4	4.73	0.00	0.00	0.00	27.27	72.73
5	4.79	0.00	0.00	0.00	21.21	78.79

**B. Penyampaian**

Min Anda : 4.81  
 Min Fakulti : 4.44  
 Min Universiti : 4.55

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.82	0.00	0.00	0.00	18.18	81.82
2	4.85	0.00	0.00	0.00	15.15	84.85
3	4.79	0.00	0.00	0.00	21.21	78.79
4	4.76	0.00	0.00	0.00	24.24	75.76
5	4.76	0.00	0.00	3.03	18.18	78.79
6	4.85	0.00	0.00	0.00	15.15	84.85
7	4.88	0.00	0.00	0.00	12.12	87.88

**C. Penilaian**

Min Anda : 4.73  
 Min Fakulti : 4.41  
 Min Universiti : 4.53

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.76	0.00	0.00	3.03	18.18	78.79
2	4.67	0.00	0.00	6.06	21.21	72.73
3	4.76	0.00	0.00	3.03	18.18	78.79
4	4.73	0.00	0.00	6.06	15.15	78.79
5	4.76	0.00	0.00	3.03	18.18	78.79

**D. Hubungan Pensyarah dan Pelajar**

Min Anda : 4.85  
 Min Fakulti : 4.48  
 Min Universiti : 4.57

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.85	0.00	0.00	0.00	15.15	84.85
2	4.79	0.00	0.00	3.03	15.15	81.82
3	4.88	0.00	0.00	0.00	12.12	87.88
4	4.91	0.00	0.00	0.00	9.09	90.91
5	4.85	0.00	0.00	0.00	15.15	84.85

**E. Penerapan Kemahiran Generik**

Min Anda : 3.79  
 Min Fakulti : 3.50  
 Min Universiti : 3.58

Item	Min	Frekuensi (Peratus)			
		1	2	3	4
1	3.85	0.00	0.00	15.15	84.85
2	3.88	0.00	0.00	12.12	87.88
3	3.91	0.00	0.00	9.09	90.91
4	3.79	0.00	0.00	21.21	78.79
5	3.70	0.00	0.00	30.30	69.70
6	3.70	0.00	3.03	24.24	72.73
7	3.70	0.00	0.00	30.30	69.70

**Statistik Pencapaian Keseluruhan**

Min Anda : 4.80  
 Min Fakulti : 4.44  
 Min Universiti : 4.55  
 Rank Anda Di UTM : P5

[Komen Pelajar Anda](#)  
[Keterangan Mengenai Rank](#)

**Catatan :**

P1 : Rank <= 20%  
 P2 : 20% < Rank <= 40%  
 P3 : 40% < Rank <= 60%  
 P4 : 60% < Rank <= 80%  
 P5 : Rank > 80%

[Laporan Sebelumnya](#)

[Laporan Seterusnya](#)

Seksyen : 01  
 Laporan Penilaian Pengajaran Pensyarah  
 Semester 2 Sesi 20192020

Bil. Responden : 31

Bil. Pelajar Mendaftar : 37

**A. Pengajaran**

Min Anda : 4.52  
 Min Fakulti : 4.42  
 Min Universiti : 4.55

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.52	0.00	0.00	6.45	35.48	58.06
2	4.48	0.00	0.00	6.45	38.71	54.84
3	4.52	0.00	0.00	3.23	41.94	54.84
4	4.55	0.00	0.00	6.45	32.26	61.29
5	4.55	0.00	0.00	3.23	38.71	58.06

**B. Penyampaian**

Min Anda : 4.54  
 Min Fakulti : 4.40  
 Min Universiti : 4.54

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.48	0.00	0.00	3.23	45.16	51.61
2	4.52	0.00	0.00	3.23	41.94	54.84
3	4.55	0.00	0.00	3.23	38.71	58.06
4	4.58	0.00	0.00	6.45	29.03	64.52
5	4.55	0.00	0.00	3.23	38.71	58.06
6	4.58	0.00	0.00	3.23	35.48	61.29
7	4.52	0.00	0.00	3.23	41.94	54.84

**C. Penilaian**

Min Anda : 4.49  
 Min Fakulti : 4.38  
 Min Universiti : 4.52

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.42	0.00	0.00	6.45	45.16	48.39
2	4.45	0.00	0.00	6.45	41.94	51.61
3	4.45	0.00	0.00	6.45	41.94	51.61
4	4.55	0.00	0.00	3.23	38.71	58.06
5	4.58	0.00	0.00	3.23	35.48	61.29

**D. Hubungan Pensyarah dan Pelajar**

Min Anda : 4.60  
 Min Fakulti : 4.43  
 Min Universiti : 4.56

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.65	0.00	0.00	0.00	35.48	64.52
2	4.48	0.00	0.00	0.00	51.61	48.39
3	4.61	0.00	0.00	0.00	38.71	61.29
4	4.58	0.00	0.00	0.00	41.94	58.06
5	4.68	0.00	0.00	0.00	32.26	67.74

**E. Penerapan Kemahiran Generik**

Min Anda : 3.45  
 Min Fakulti : 3.49  
 Min Universiti : 3.56

Item	Min	Frekuensi (Peratus)			
		1	2	3	4
1	3.55	0.00	0.00	45.16	54.84
2	3.35	0.00	6.45	51.61	41.94
3	3.61	0.00	0.00	38.71	61.29
4	3.61	0.00	0.00	38.71	61.29
5	3.29	0.00	12.90	45.16	41.94
6	3.19	9.68	0.00	51.61	38.71
7	3.52	3.23	0.00	38.71	58.06

**Statistik Pencapaian Keseluruhan**

Min Anda : 4.54  
 Min Fakulti : 4.41  
 Min Universiti : 4.54  
 Rank Anda Di UTM : P3

[Komen Pelajar Anda](#)  
[Keterangan Mengenai Rank](#)

**Catatan :**

P1 : Rank <= 20%  
 P2 : 20% < Rank <= 40%  
 P3 : 40% < Rank <= 60%  
 P4 : 60% < Rank <= 80%  
 P5 : Rank > 80%

[Laporan Sebelumnya](#)

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Seksyen : 04  
 Laporan Penilaian Pengajaran Pensyarah  
 Semester 1 Sesi 20202021

Bil. Responden : 22

Bil. Pelajar Mendaftar : 39

**A. Pengajaran**

Min Anda : 4.75  
 Min Fakulti : 4.44  
 Min Universiti : 4.58

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.73	0.00	0.00	0.00	27.27	72.73
2	4.73	0.00	0.00	0.00	27.27	72.73
3	4.82	0.00	0.00	0.00	18.18	81.82
4	4.77	0.00	0.00	0.00	22.73	77.27
5	4.73	0.00	0.00	0.00	27.27	72.73

**B. Penyampaian**

Min Anda : 4.74  
 Min Fakulti : 4.41  
 Min Universiti : 4.57

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.77	0.00	0.00	0.00	22.73	77.27
2	4.77	0.00	0.00	0.00	22.73	77.27
3	4.68	0.00	0.00	0.00	31.82	68.18
4	4.73	0.00	0.00	0.00	27.27	72.73
5	4.77	0.00	0.00	0.00	22.73	77.27
6	4.73	0.00	0.00	0.00	27.27	72.73
7	4.73	0.00	0.00	0.00	27.27	72.73

**C. Penilaian**

Min Anda : 4.76  
 Min Fakulti : 4.37  
 Min Universiti : 4.54

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.82	0.00	0.00	0.00	18.18	81.82
2	4.73	0.00	0.00	0.00	27.27	72.73
3	4.73	0.00	0.00	0.00	27.27	72.73
4	4.77	0.00	0.00	0.00	22.73	77.27
5	4.77	0.00	0.00	0.00	22.73	77.27

**D. Hubungan Pensyarah dan Pelajar**

Min Anda : 4.75  
 Min Fakulti : 4.46  
 Min Universiti : 4.59

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.73	0.00	0.00	0.00	27.27	72.73
2	4.73	0.00	0.00	0.00	27.27	72.73
3	4.77	0.00	0.00	0.00	22.73	77.27
4	4.73	0.00	0.00	0.00	27.27	72.73
5	4.77	0.00	0.00	0.00	22.73	77.27

**E. Penerapan Kemahiran Generik**

Min Anda : 3.81  
 Min Fakulti : 3.52  
 Min Universiti : 3.58

Item	Min	Frekuensi (Peratus)			
		1	2	3	4
1	3.82	0.00	0.00	18.18	81.82
2	3.82	0.00	0.00	18.18	81.82
3	3.82	0.00	0.00	18.18	81.82
4	3.82	0.00	0.00	18.18	81.82
5	3.82	0.00	0.00	18.18	81.82
6	3.82	0.00	0.00	18.18	81.82
7	3.77	0.00	0.00	22.73	77.27

**Statistik Pencapaian Keseluruhan**

Min Anda : 4.75  
 Min Fakulti : 4.42  
 Min Universiti : 4.57  
 Rank Anda Di UTM : P4

[Komen Pelajar Anda](#)  
[Keterangan Mengenai Rank](#)

**Catatan :**

P1 : Rank <= 20%  
 P2 : 20% < Rank <= 40%  
 P3 : 40% < Rank <= 60%  
 P4 : 60% < Rank <= 80%  
 P5 : Rank > 80%

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Seksyen : 01  
 Laporan Penilaian Pengajaran Pensyarah  
 Semester 2 Sesi 20202021

Bil. Responden : 24

Bil. Pelajar Mendaftar : 30

**A. Pengajaran**

Min Anda : 4.64  
 Min Fakulti : 4.47  
 Min Universiti : 4.60

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.63	0.00	0.00	4.17	29.17	66.67
2	4.58	0.00	0.00	4.17	33.33	62.50
3	4.71	0.00	0.00	0.00	29.17	70.83
4	4.58	0.00	0.00	0.00	41.67	58.33
5	4.71	0.00	0.00	0.00	29.17	70.83

**B. Penyampaian**

Min Anda : 4.63  
 Min Fakulti : 4.45  
 Min Universiti : 4.59

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.67	0.00	0.00	0.00	33.33	66.67
2	4.63	0.00	0.00	0.00	37.50	62.50
3	4.67	0.00	0.00	0.00	33.33	66.67
4	4.58	0.00	0.00	0.00	41.67	58.33
5	4.67	0.00	0.00	0.00	33.33	66.67
6	4.58	0.00	0.00	4.17	33.33	62.50
7	4.63	0.00	0.00	4.17	29.17	66.67

**C. Penilaian**

Min Anda : 4.63  
 Min Fakulti : 4.42  
 Min Universiti : 4.57

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.63	0.00	0.00	0.00	37.50	62.50
2	4.67	0.00	0.00	0.00	33.33	66.67
3	4.63	0.00	0.00	0.00	37.50	62.50
4	4.63	0.00	0.00	0.00	37.50	62.50
5	4.63	0.00	0.00	4.17	29.17	66.67

**D. Hubungan Pensyarah dan Pelajar**

Min Anda : 4.69  
 Min Fakulti : 4.49  
 Min Universiti : 4.62

Item	Min	Frekuensi (Peratus)				
		1	2	3	4	5
1	4.75	0.00	0.00	0.00	25.00	75.00
2	4.67	0.00	0.00	0.00	33.33	66.67
3	4.67	0.00	0.00	0.00	33.33	66.67
4	4.71	0.00	0.00	4.17	20.83	75.00
5	4.67	0.00	0.00	4.17	25.00	70.83

**E. Penerapan Kemahiran Generik**

Min Anda : 3.57  
 Min Fakulti : 3.53  
 Min Universiti : 3.58

Item	Min	Frekuensi (Peratus)			
		1	2	3	4
1	3.58	0.00	4.17	33.33	62.50
2	3.63	0.00	0.00	37.50	62.50
3	3.67	0.00	0.00	33.33	66.67
4	3.63	0.00	0.00	37.50	62.50
5	3.46	4.17	0.00	41.67	54.17
6	3.42	8.33	0.00	33.33	58.33
7	3.58	4.17	0.00	29.17	66.67

**Statistik Pencapaian Keseluruhan**

Min Anda : 4.65  
 Min Fakulti : 4.46  
 Min Universiti : 4.60  
 Rank Anda Di UTM : P3

[Komen Pelajar Anda](#)  
[Keterangan Mengenai Rank](#)

**Catatan :**

P1 : Rank <= 20%  
 P2 : 20% < Rank <= 40%  
 P3 : 40% < Rank <= 60%  
 P4 : 60% < Rank <= 80%  
 P5 : Rank > 80%

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