1.	Name of course:	Introdu	Introduction to Programming									
2.	Code of course:	CSS31	13									
3.	Synopsis:	The co syntax, input/ou system embede	urse covers problem solving skills, writing algorithms, basic programming control structures (loops, if statements, switches), functions and utput operations. Knowledge of C programming varies including operating s and various application software for computer architectures and ded system.									
4.	Name(s) of academic staff:	Jackie	Ting Tiew Wei									
5.	Semester and year of offered	Semes	ter 1, Year 1									
6.	Credit value:	3	3									
7.	Prerequisite/co- requisite (if any):	None										
8.	Learning	Programme Educational Objectives (PEO):										
	outcomes:	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	duates will pursue lifelong learning in order to contribute to the rancement of information technology and computer science fessions and related competency issues.									
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member									
		PLO7 Apply broad business and real world perspectives daily and de entrepreneurship skills related to computer science practice, ar										
		PLO8	Communicate effectively with the software system development community and with the society at large									
		PLO9	Apply skills and principles of lifelong learning in both academic and career development									
	Course Learning Outcomes (CLO):											

				compl	pletion of the course, the students should be able to:											
				CLO1	App pro	ly the grams	basic for gi	prob ven p	lem-: proble	solv ems	ing te (C3,	echi PL	niques to dev O4)	velo	p algorithr	ns and
				CLO2	Cor con	istruct struct	comp flow c	olete harts	progr for c	ams com	s bas puter	ed co	on a given sp de (C6, PLO2	beci 2)	fication ar	nd
				CLO3	Dev able	elopir to pr	ng con esent	nplete solut	e pro	grar lear	n an Iy an	d gi d co	ve appropriat onfidently (C6	te ju 6, P	ustification LO1)	and
9.	Mapping o Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	omes	s to t	he P	rog	ram	min	ig Learning	Ou	tcomes, 1	Feaching
	Course Learning Outcomes (CLO)	PL01	PLO2	Program PLO3	PLO4	PLO5	PLO6	PLO7		08	PLO9	T€	eaching Method	ls	Assess	sment
	CLO1				3							Le	cture, Tutorial		Progress T Final Exam	est, ination
	CLO2		3									Le Pra ba:	cture, Tutori actical, Compute sed Learning	al, er-	Assignmen Progress T	t, est
	CLO3	3										Pra ba	actical, Compute sed Learning	er-	Presentatio	n
	Note: 1 = Lit	tle Con	tributior	n; 2 = Ma	oderate	Contrib	oution; 3	B = Stro	ong Co	ontrik	oution					
10.	Transferat	ole ski ole):	lls	Knowl	edge;	Proble	em Sc	lving	and	Scie	entifi	c Sł	kills			
11.	Distributio	n of S	tude	nt Lea	rning	Time	<u>(SLT)</u>	:	Т	each	ing ar	nd I	earning Activiti	es		
	Coι		CLO	0	Guide	d Lea	rning	g (F2F	;)	Guided	Inc	dependent earning	Total SLT			
	1 Introduce							L	т	Ρ		0	(NF2F)		(NF2F)	_
	- Introduce - Intro- Hist Lan Pro	oduction tory and iguages cess	n to Pro I Type o	ogrammi of Progra Progra	ng amming amming	1,2	2	2							2	4
	2. Problem Solving and Algorithms - What Problem Solving is? The Software Development Method of Problem Solving Steps in the Software Development Method Design and Representation of Algorithms Programming Errors and Debugging Program Verification and Testing Program Documentation Introduction to Co-Drone and Arduino					1,2	2	2							2	4
	 3. Fundamental of Programming The Programming Language Character Set and Tokens Programming Language Structure Programming Language Styles Arduino IDE introduction and simulation with drone 				1,2,	3	2	2						4	8	
	 4. Control Structure Selection Structures Repetition Control Structures Structure Programming 				1,2,	,3	2							2	4	

	5. Arithmetic Calculation - Basic Arithmetic Operators - Type of Arithmetic Expression	1,2,3	2	2			4	8
	6. Functions - Function Definitions - Function Prototypes - Calling Function - Random Number Generation - Storage Classes - Scope Rules - Recusive	1,2,3	2				1	3
	 7. Array Defining Arrays Array Examples Passing Arrays to Functions Sorting Array Searching Array 	1,2,3	2		2		3	7
-	 8. Characters and Strings Fundamental of Strings and Characters Character Handling Library String Conversion Functions Standard Input / Output Library Functions String Manipulation Functions of the String Handling Library Comparison Functions of String Handling Library Search Functions of the String Handling Library 	1,2,3	2	2	2		2	8
	 9. Formatted Input/Output Streams Formatting Output Printing Integers Printing Floating Point Numbers Printing Strings and Characters Project co- drone 	1,2,3	2	2	2		1	7
	 10. Formatted Input/ Output -cont Other Conversion Specifiers Printing with Fields Widths And Precision Printing Literals and Escape Sequences Reading Formatted Input Project co- drone 	1,2,3	2		2		2	6
	 Basic Data Structures Structure Definition and Initialisation Accessing Members of Structures Using Structures with Functions 	1,2,3	2		2		3	7
	 Basic Data Structures - Cont. Unions Bitwise Operators Bit Fields Enumeration Constants 	1,2,3	2		2		3	7
	13. File OperationThe Data HierarchyFiles	1,2,3	2				1	3

	14. File Operation – cor - Sequential Acces - Random Access - Project co- drone	nt ss File File e	1,2,3	2					0	2			
		Tot	al (SLT)	28	8	12			30	78			
	Continues	Assessment					Perce	ntage (%)		Total SLT			
	1. Progress Test							20		4			
	2. Assignment							30		18			
	3. Presentation							10		10			
	Final As	sessment			Percentage (%)								
	1. Final Examination			40 10									
		Tot	al (SLT)				1	00%		42			
	L – Locturo, T – Tutoriol, D	- Practical O - O	thora E2E	E – Eoor	to Foo		- Non	GRAN	ND TOTAL SLT	1 20			
12.	Identify special requirement or resources to deliver the course:	Co drone, Ard	duino ID	E									
13.	References:	Main reference Jeff Szuh programm Publishing Additional ref Rajiv Cho Learning Paul Deite Harvey De	 <u>Main reference supporting the course</u> Jeff Szuhay(2020) .Learn C Programming: A beginner's guide to learning C programming the easy and disciplined way 1st Edition, Publisher : Packt Publishing; 1st Edition (June 26, 2020). ISBN-13: 978-1789349917 <u>Additional references</u> Rajiv Chopra.(2017). C Programming: A Self-Teaching Introduction, Mercury Learning & Information ,ISBN: 978-1683920908 Paul Deitel. (2016), C How to Program, 8th Edition. Deitel & Associates, Inc. Harvey Deitel. Pearson, ISBN: 9780133977288 										
14.	Other additional information:	None											

1.	Name of course:	Discrete	Discrete Mathematics									
2.	Code of course:	CSS32	13									
3.	Synopsis:	This co and app	urse provides the knowledge about logic, set, functions, graph, and trees; bly the theories to solve the problem.									
4.	Name(s) of academic staff:	Yiiong S	Siew Ping									
5.	Semester and year of offered	Semest	ter 1, Year 1									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	None	None									
8.	Learning	Program	nme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		Program Upon co	nme Learning Outcomes (PLO): mpletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	PLO8 Communicate effectively with the computing development community and with the society at large, and									
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.									
		Course Upon co	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									
		CLO1	Demonstrate the ability to perform logical reasoning and induction (C3, PLO1)									

				CLO2	Solv	/e the	the problem with logical thinking (C3, PLO4)									
				CLO3	For	nulate	e state	emen	t bas	ed on	logic	al thinking (C6	6, PLO2)			
9.	Mapping of Methods a	of the Ind As	Cour	se Lea ment:	arning	Outo	Dutcomes to the Programming Learning Outcomes, Teach									
	Course		P	rogram	me Lea	rning C	Dutcom	nes (P	LO)	-						
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	D8 PLC	7 ₉₀	eaching Method	ls Assess	sment		
	CLO1	2									L	ecture, Tutorial,	Assignmen Final Exam	t, ination		
	CLO2				3						L	ecture, Tutorial,	Assignmen Final Exam	t, ination		
	CLO3		3								L	ecture, Tutorial,	Assignmen Examinatio	est, t, Final n		
	Note: 1 = Li	ttle Cont	tributio	n; 2 = Ma	oderate	Contrib	oution; 3	B = Str	ong Co	ontribut	ion					
10.	Transferal (if applical	ole ski ble):	lls	Knowl	edge;	Proble	em so	lving	and	scient	ific sł	cills.				
11.	Distributio	on of S	Stude	nt Lea	rning	Time	(SLT)	:								
		-						Guida	T colb	eaching rning (I	g and	Learning Activiti	les Independent	Total		
		ourse Co	ontent	Outline		CL	_0	L	T	P	0	Learning (NF2F)	Learning (NF2F)	SLT		
	1. Logic • In • P	troductio	on to Lo onal Eq	ogic uivalenc	es	3	3	2	-				3	5		
	2. Logic - • P Si • N	cont. redicate ets ested Q	d and C uantifie	Quantifie	rs	3	3	2	2				2	6		
	3. Logic - • M • P	cont. ethod of roof Met	f Proof hods a	nd Strate	egy	3	3	2	2				2	6		
	4. Set • In • S	troductio et Opera	on to S ations	et		3	3	2	2				2	6		
	5. Set • Set	et Opera	ations			3	3	2	2				2	6		
	6. Functio	on Iuction to	o Funct	tion		2	2	2	2				2	6		
	7. Functio	on equence on and F	e and S Recursi	ummatic	ons	2	2	2	2				2	6		
	M 8. Inducti	athemat	tical Ind Recursi	duction ion		1		2	0				2			
	• R Si	tructural	Induct	ion	s an			2	2				3			
	9. Countil • Bi • Ti	ng asics of he Pigeo	Countii onhole	ng Principle)	2	2	2	2				2	6		
	10. Countii Pi Bi G C Relatio • R	ng ermutati inomial (eneraliz ombinat ons elation	on and Coeffici ed Pe ions and	Combin ients ermutatio Prope	nation ons an rties d	d 2	3	2	2				2	6		
	R 11. Relatio	elation	and			,										
	• R	epresen	ting Re	lations		2,	3	2	2				2	6		

	Equivalence Re											
	12. Graphs Introduction to C Graph Terminol Representing C Isomorphism	Graphs logy Graphs and Graph	2	2	2				2	6		
	 13. Graphs Connectivity Euler and Hami Planar Graphs Trees Introduction to 1 Application of T 	Iton Path Frees ress	2	2	2				2	6		
	14. Tress • Tree Traversal • Spanning Trees • Binary Trees	3	2	2	2				2	6		
		Total	(SLT)	28	28	-	-	-	28	84		
				1								
	Continues		Percentage (%) Total									
	1. Progress Test		20 4									
	2. Assignment						30		20			
	Final Ass	sessment					Percei	ntage (%)		Total SLT		
	1. Final Examination				12							
		Total	Total (SLT) 100%									
	L = Lecture, T = Tutorial, P	= Practical, O = Oth	ers, F2F	F = Face to Face, NF2F = Non Face to Face								
12.	Identify special requirement or resources to deliver the course:	None										
13.	References: Main references: • Epp. (2020). Discrete Mathematics with Applications, Metric Edition. ISBN: 9780357114087 • Rosen, K. (2018). Discrete Mathematics and Its Applications, 8th Edition, McGraw-Hill Education. ISBN: 9781260091991 Additional references: • Harry, L. & Rachel. Z. (2019). Essential Discrete Mathematics for Computer Science. Princeton University Press. • Oscar, L. (2018). Discrete Mathematics: An Open Introduction. Independently published.											
14.	Other additional information:											

1.	Name of course:	Introdu	Introduction to Software Engineering									
2.	Code of course:	CSS34	13									
3.	Synopsis:	This co procedu as pro develop mainter	ourse offers the fundamental knowledge of the methods, tools and ures of software engineering which include a wide range of activities such ject planning, system and software requirements analysis, design, oment, configuration management, testing, documentation and nance of software, system modelling and specification notations.									
4.	Name(s) of academic staff:	Daniel	Tan Yong Wen									
5.	Semester and year of offered	Semes	ter 1, Year 1									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	None	None									
8.	Learning	Program	Programme Educational Objectives (PEO):									
	outcomes:	PEO1 Graduates will be employed or self-employed in relevant conscience field with good level of knowledge and competency sk appropriate attitude enabling them to have successful career.										
PEO2 Graduates will acquire abilities for effective communication, of working in diverse teams, and continual development professional involvement.												
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		<u>Progran</u> Upon c	<u>nme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	Communicate effectively with the computing development community and with the society at large, and									
		PLO9 Apply skills and principles of lifelong learning in both academic and c development.										

			<u>e Lear</u> comple	ning (etion (<u>Dutcor</u> of the	<u>mes (</u> cours	<u>CLO)</u> e, the	<u>:</u> stud	ent	ts s	should be abl	e to	:			
				CLO1	Ider	ntify di	ifferen	t met	hod ir	n softv	var	re o	development	(C2	, PLO2)	
				CLO2	Арр	ly app	oropria	ate so	ftware	e deve	elo	pm	nent models (C3,	PLO3)	
				CLO3	Арр	ly app	oropria	ate teo	chniqu	ue in d	diff	ere	ent stage of S	DLC	C (C5, PL0	D4)
9.	Mapping of Methods a	of the	Cour	se Lea ment:	arning	Outo	comes	s to t	he Pr	ogra	mn	nin	ng Learning	Out	comes, T	eaching
	Course		F	rogram	me Lea	rning (Outcom	es (PL	.0)	1						
	Cutcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	B PLO	9	Te	eaching Method	ls	Assess	ment
	CLO1		3									Le	cture, Tutorial		Progress Te Assignment Final Exami	est, , nation
	CLO2			3								Le	cture, Tutorial		Progress Te Assignment Final Exami	est, ;, nation
	CLO3				3							Le	cture, Tutorial		Progress Te Assignment Final Exami	est, , nation
	Note: 1 = Lit	ttle Con	tributio	n; 2 = Mo	oderate	Contrib	oution; 3	B = Stro	ong Co	ntributio	on					
10.	Transferat (if applical	ole ski ole):	lls	Knowl	edge;	Practi	ical Sk	kills; F	Proble	em So	lvir	ng	and Scientific	: Sk	ills.	
11.	Distributio	n of S	stude	nt Leai	rning	Time	(SLT)	:								
								Cuida	Te	aching	an	d L	earning Activiti	ies	opondopt	Total
	Со		CL	0	L	T	P	(, ว	Learning (NF2F)	L	earning (NF2F)	SLT			
	 Introdu The Ro Softwa Softwa and Pro 	ction to bles of S re Appli re Engir ofessior	Software oftware cations neering al Prac	re Engin e Engine Code of ctices.	eering er. f Ethics	1,2,	,3	2							2	4
	 2. Softwa Models Softwa (SDLC) 	re Dev ; re Dev).	elopme	ent Life ent Life	Cycle Cycle	1,2	2	2	2						4	8
	3. SoftwaSequerIterative	re Proce ntial Life e Life C	esses Cycle ycle Mo	Model. odel.		1,2	2	2							2	4
	4. ProjectProjectChange	Manag Manag Manag	ement ement. gement			1,2	2	2	2						4	8
	 Change Management. Software Requirements Gathering Data Types Requirements/Data Gathering Techniques Data Collection Techniques and Application Types 				3	:	2							2	4	
	 6. Require Proces Feasibi Require Analysi Require Require 	ements ses ility Stuc ements is ements ements	lies Eli Validat Manag	Engin citation ion ement	and	3		2	2						4	8

					1					
	 7. System Models Context Models Behavioural Models Data Models Object Models Structured Methods 		2,3	2					2	4
	 8. Architectural Design System Structuring Control Models Modular Decomposit Domain-Specific Arc 	ion hitectures	1,3	2	2				4	8
	 9. Distributes Systems Multiprocessor Archi Client-Server Archite Distributed Object Ar CORBA 	Architectures tectures ectures rchitectures	1,3	2					2	4
	10. Rapid Software DeveAgile MethodExtreme Programming	1,3	2	2				4	8	
	 11. Rapid Software Deve Rapid Application (RAD) Software Prototyping 	1,3	2					2	4	
	 Software Evolution Program Evolution D Software Maintenand Evolution Process Legacy System Evol 	1,3	2	2				4	8	
	 Verification and Valid Verification and Valid Software Inspections Automated Static An Cleanroom Software 	dation dation Planning s alysis Development	1,3	2					2	4
	 14. Software Testing Software Testing Tel Software Testing Str Software Test Cover 	rminologies. ategies. age.	1,3	2	2				4	8
		Tot	al (SLT)	28	14	0	0	0	42	84
	Continues /	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							20		4
	2. Assignment							30		18
	3. Presentation							10		4
	Final As	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination							40		10
		Tot	al (SLT)				10	00%		36
			· -					GRAN	D TOTAL SLT	120
L = Lecture, T = Tutorial, P = Practical, O = Others, F2F = Face to Face, NF2F = Non Face							Face to Face			
12.	Identify special requirement or resources to deliver the course:	None								

13.	References:	 <u>Main references:</u> Sommerville, I. (2019). Engineering software products (1st ed.). Pearson. Winters, T., Wright Hyrum, & Manshreck, T. (2020). Software Engineering at Google (1st ed.). O'Reilly Media. <u>Online References:</u> [1] Saylor Academy, "Software Development Life Cycle Models," 2020. [Online] Available:
		https://learn.saylor.org/course/view.php?id=73§ionid=694.
		[2] Saylor Academy, "Project Management," 2020. [Online]. Available: https://learn.saylor.org/course/view.php?id=73§ionid=701.
		[3] Saylor Academy, "Software Requirements Gathering," 2020. [Online]. Available: https://learn.saylor.org/course/view.php?id=73§ionid=696.
		[4] Saylor Academy, "Software Testing," 2020. [Online]. Available: https://learn.saylor.org/course/view.php?id=73§ionid=700.
14.	Other additional information:	None

1.	Name of course:	Data C	Data Communication and Networking								
2.	Code of course:	CSS35	13								
3.	Synopsis:	To prov student within c	vide the students with the knowledge of OSI layered model so that the is are able to understand the LAN and WAN design and implement them organisations.								
4.	Name(s) of academic staff:	Khairur	nnisa Ibrahim								
5.	Semester and year of offered	Semes	ter 1, Year 1								
6.	Credit value:	3									
7.	Prerequisite/co- requisite (if any):	None									
8.	Learning	Program	mme Educational Objectives (PEO):								
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.								
		PEO2 Graduates will acquire abilities for effective communication, colla working in diverse teams, and continual development professional involvement.									
		PEO3 Graduates will pursue lifelong learning in order to con advancement of information technology and comp professions and related competency issues.									
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:								
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and								
		PLO2	Apply theoretical principles of computer science in relevant areas, and								
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and								
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and								
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and								
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and								
		PLO7	PLO7 Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and								
		PLO8	Communicate effectively with the computing development community and with the society at large, and								
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.								
Course Learning Outcomes (CLO): Upon completion of the course, the students should be able to:											

				CLO1	Sur netv	ummarise the fundamental building blocks of communications and etworking Statement (C5, PLO2)										
				CLO2	Cor com	nstruct nmunic	and c	deplo med	y con a Sta	npute	er ne ent (etw (C6	ork using wire 3, PLO4)	ed or wireless	;	
				CLO3	Der or v	nonstr vorkinę	ate th g envi	e nee ronm	eds o ent S	f con tater	nput nen	ter i t (C	network to de C3, PLO9)	evelop a bette	r living	
9.	Mapping o Methods a	of the nd As	Cour sess	se Lea ment:	arning	Outo	omes	s to t	he P	rogr	amr	min	ng Learning	Outcomes, 1	Feaching	
	Course		F	Program	me Lea	rning C	Outcom	ies (Pl	.0)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	98 PI	_09	Te	eaching Method	ls Assess	sment	
	CL01		3										Lecture, Tutorial	Progres Assigr Final Exa	Progress Test, Assignment Final Examination	
	CLO2				3								Lecture, Tutorial	Progres Assigr Final Exa	s Test, iment mination	
	CLO3										3		Lecture, Tutorial	Progres Assigr Final Exa	s Test, iment mination	
10.	Transferat	Transferable skills (if applicable):Knowledge Lifelong LeDistribution of Student Learning					em so Skills	olving	and	scie	ntifi	c s	kills; Informa	tion Manage	ment and	
11.	Distributio	rnina	Time	(SLT)	:											
							-	Те	achir	ng an	nd L	earning Activiti	es			
	Cou	ırse Co	ntent	Outline		CLO	b	Guided Learning (F2F))	Guided	Independent	Total			
								L	т	Ρ	(О	Learning (NF2F)	Learning (NF2F)	SLT	
	1. Introduction Data 0 Network Protoco Stand	tions	1,2,	3 2	2	2					2	6				
	2. OSI Mode Introdu Functi TCP/II OSI vs	els uction to ons of t P S TCP/IF	o the O he Lay	SI Mode ers	ls	1,2,	3 :	2	2					2	6	
	 3. Transmiss Transi Types Applic mediu 	sion Me mission of Cabl ation a m	dia Mediu le / trar and it	m nsmissior s transr	n mission	1,2,	3 :	2	2					2	6	
	 medium 4. Signals Analogue and Digital Periodic and Aperiodic Signals Analogue Signals Time and Frequency Domains Digital Signals 					1,2,	3 :	2	2					2	6	
	 5. Digital Transmission Digital to Digital Conversion Line and Block Coding Analogue to Digital Conversion Pulse Code Modulation (PCM) and Amplitude Modulation (PAM) Transmission Modes: Parallel and Serial 					1,2,	3 2	2	2					2	6	
	6. AnalogueDigitalAnalog	on ersion	1,2,	3 :	2	2					2	6				

	 7. Multiplexing Frequency-Division (FDM) Wave-Division Multi Time-Division Multiple 	Multiplexing plexing (WDM) plexing (TDM)	1,2,3	2	2				2	6
	 8. Multiplexing (part 2) Frequency Hop Spectrum (FHSS) Digital Subscriber L Modems 	ping Spread ine (DSL)	1,2,3	2	2				2	6
	 9. Switching Concept of Switchin Circuit Switched Ne Packet Switche Datagram Networ Circuit Networks Switches 	ig tworks d Networks: k and Virtual	1,2,3	2	2				2	6
	 10. Error Detection and (1) Types of Error Detection and Corre Coding: Block Concords 	Corrections (part ection ding and Block	1,2,3	2	2				2	6
	11. Error Detection and (2) Cyclic Redundancy Checksum Error Correction	1,2,3	2	2				2	6	
	12. Data Link Control Line Discipline Flow Control Error Control	1,2,3	2	2				2	6	
	 13. Data Link Protocol Asynchronous Proto Synchronous Proto Character-Oriented Bit-Oriented Protoco Link Access Proced 	ocols cols Protocols ols lures	1,2,3	2	2				2	6
	 14. Network Layer Notational syst hexadecimal, decim IP v4 address and c IP v4 subnetting and 	em (binary, ial) ilasses d supernetting	1,2,3	2	2				2	6
		Tot	al (SLT)	28	28				28	84
	Continues /	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							10		4
	2. Assignment							30		20
	3. Presentation							10		2
	Final Ass	sessment					Percer	ntage (%)		SLT
	1. Final Examination							50		10
		al (SLT)				10	00%		36	
	L = Lecture, T = Tutorial. P	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face	D TOTAL SET	120	
12.	Identify special			-						
	requirement or resources to deliver the course:									
13.	References:	Main reference	ces supp	porting	the co	ourse:				

		 Oliver C Ibe. (2018) Fundamental of Data Communication Networks. John Wiley & Sons, Inc. ISBN:9781119436256
		 <u>Additional references supporting</u> Forouzan, B. (2012). Data Communications and Networking (5th Ed.). New York, NY: McGraw-Hill. ISBN-13: 978-0073376226. Comer, D. (2014). Computer networks and Internets (6th Ed.). Boston: Addison-Wesley. ISBN-13:978-0133587937
14.	Other additional information:	None

1.	Name of course:	Compu	Computer Architecture									
2.	Code of course:	CSS35	23									
3.	Synopsis:	This concern	ourse provides the knowledge about the computer architecture and nents of the computer such as system buses, memory, I/O, and CPU.									
4.	Name(s) of academic staff:	Daniel	Tan Yong Wen									
5.	Semester and year of offered	Semes	ter 1, Year 1									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	None										
8.	Learning	Program	mme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	Communicate effectively with the computing development community and with the society at large, and									
		PLO9	2LO9 Apply skills and principles of lifelong learning in both academic and career development.									
		<u>Course</u> Upon c	ourse Learning Outcomes (CLO): pon completion of the course, the students should be able to:									
		CLO1	Explain internal structure of a computer system and the relationship between the functionalities and the hardware (C2, PLO1)									

			Use requ	Jse hardware components to build a computer system based on different requirement and needs (C3, PLO2)											
				CLO3	Ana con	llyse t figurat	he im tion ba	porta ase or	nce on the	of app differe	rop nt r	oria neo	ite hardware	e for compute uirements (C4	er system , PLO3)
9.	Mapping of Methods a	of the nd As	Cour: sessr	se Lea nent:	arning	Outo	omes	s to tl	ne Pi	ograr	nm	in	g Learning	Outcomes, T	Feaching
	Course		Р	rogram	me Lea	rning C	Dutcom	es (PL	0)						
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	B PLOS	,	Те	aching Method	ls Assess	sment
	CLO1	3									I	Lec	ture, Tutorial	Progress Te Final Exam	est, ination
	CLO2		2								l	Lec	ture, Tutorial	Final Exami Assignment	ination,
	CLO3			3							l	Lec	ture, Tutorial	Assignment	
	Note: $1 = Lit$	tle Cont	ributior	1; 2 = Mc	oderate	Contrib	ution; 3	= Stro	ng Col	ntributio	n				
10.	Transferat (if applicat	ole ski ole):	lls	Knowl	edge;	Practi	cal Sk	tills							
11.	Distributio	n of S	tuder	nt Lea	rning	Time	(SLT)		Te	achina	and	LE	arning Activiti	es	
	Co	Course Content Outline						Guideo	Lear	nina (F:	2F)		Guided	Independent	Total
	Col		CLO		L	т	P	0		Learning (NF2F)	Learning (NF2F)	SLT			
	 Introduction to Computer Architecture History of Computer Organisation and Architecture of Computer System Structure and Function of Computer System 				1,2,	3 2	2						2	4	
	 2. System Computer Function Intercond 	i Buses iter ons nnectior	Compo	onents ures	and	1,2,	3	2	2					4	8
	3. SystemBus IntPCI	n Buses erconne	- cont. ection			1,2,	3 2	2						2	4
	 4. Interna Compute Semico Cache Advance 	I Memor ter Mem onductor memory ced DRA	y nory Sy Main M and O M Orga	stem Ov Memory Irganisat anisatior	verview ion า	1,2,	3 :	2	2					4	8
	Advanced DRAM Organisation Advanced DRAM Organisation External Memory Magnetic Disk RAID Optical Memory Magnetic Tape Solid-State Disk (SSD)				1,2,	3 2	2						2	4	
	 6. Input / Externa I/O Mod Program 	Output al Device dules mmed I/	es O			1,2,	3 2	2	2					4	8
	 7. Input / Output - cont. Interrupt Driven I/O I/O Channels and Processor External Interface 				1,2,	3	2						2	4	
	8. Operating System Support Scheduling Memory Management					1,2,	3	2	2					4	8
	Computer Arithmetic					1,2,	3 3	2						2	4

	 The Arithmetic and L Integer Representati Integer Arithmetic 	ogic Unit (ALU) on									
	 Computer Arithmetic Floating Point Repre Floating Point Arithm 	- cont. sentation netic	1,2,3	2	2				4	8	
	 Instruction Set Machine Instruction Type of Operands Data Types of Diff Platform Types of Operations 	Characteristics erent Processor	1,2,3	2	2				4	8	
	 12. CPU Structure and F Processor Organisation Register Organisation The Instruction Cycle 	Function ion n Ə	1,2,3	2					2	4	
	 13. CopmTIA Suppleme System Components System Cooling BIOS and UEFI Sy Using Device Configuring Periph Bluetooth and NFC 	nt Topics s vstem Firmware verals	1,2,3	2	2				4	8	
	14. Revision		1,2,3	2					2	4	
		Tot	al (SLT)	28	14	-	-	-	42	84	
	Continues	Assessment			Total SI T						
	1 Progress Test							20		4	-
	2 Assignment							30		 	-
	2.7 toolgrintont			10	_						
	3. Presentation						10		4		
	3. Presentation Final As	sessment					Perce	10 ntage (%)		4 Total SLT	
	3. Presentation Final Ass 1. Final Examination	sessment					Perce	10 ntage (%) 40		4 Total SLT 10	
	3. Presentation Final Ass 1. Final Examination	sessment Tot	al (SLT)				Percer	10 ntage (%) 40 00%		4 Total SLT 10 36	
	3. Presentation Final Ass 1. Final Examination	sessment Tot	al (SLT)				Percer 1	10 htage (%) 40 00% GRAN	ID TOTAL SLT	4 Total SLT 10 36 120	
	3. Presentation Final As: 1. Final Examination L = Lecture, T = Tutorial, P	sessment Tot = Practical, O = O	al (SLT) thers, F2P	F = Face	e to Fac	e, NF2F	Percer 1 = Non	10 htage (%) 40 00% GRAN Face to Face	ID TOTAL SLT	4 Total SLT 10 36 120	
12.	3. Presentation Final As: 1. Final Examination L = Lecture, T = Tutorial, P Identify special requirement or resources to deliver the course:	sessment Tot = Practical, O = O None	al (SLT) thers, F2F	F = Face	e to Face	e, NF2F	Percei 1 = Non	10 htage (%) 40 00% GRAN Face to Face	ID TOTAL SLT	4 Total SLT 10 36 120	
12.	3. Presentation Final As: 1. Final Examination L = Lecture, T = Tutorial, P Identify special requirement or resources to deliver the course: References:	sessment Tot = Practical, O = O None <u>Main reference</u> • Stallings, Pearson. <u>Additional refe</u> • http://willi	al (SLT) thers, F2F <u>Ces:</u> W. (20 ⁻¹ ISBN-1 <u>erences</u> amstalli	19). Co 3: 978 <u>:</u> ngs.co	e to Face ompute 01349 om/CO	e, NF2F er Orga 997193	Percer 1 = Non anizat	10 htage (%) 40 00% GRAN Face to Face ion and Arch hst.html	ID TOTAL SLT	4 Total SLT 10 36 120 Ed.).	

1.	Name of course:	Design	Design Thinking and Presentation										
2.	Code of course:	CSS36	42										
3.	Synopsis:	Practica present service Throug practice powerfu that en	al thinking processes, problem solving techniques and effective tation skills are critical to produce and pitch innovative ideas, products, s and user experiences that engages and excites users/customers. h a Maker/Hackathon event and a series of TED masterclass, students will e Design Thinking on a real-world project by equipping themselves with a ul set of collaborative and innovative tools, and compelling storytelling skills ables strong connections with users/customers.										
4.	Name(s) of academic staff:	Jackie	Ting Tiew Wei										
5.	Semester and year of offered	Semes	ter 1 Year 1										
6.	Credit value:	2	lone										
7.	Prerequisite/co- requisite (if any):	None											
8.	Learning	Program	rogramme Educational Objectives (PEO):										
	outcomes:	PEO1	Fogramme Educational Objectives (PEO): EO1 Graduates will be employed or self-employed in relevant com science field with good level of knowledge and competency skills appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		Program	mme Learning Outcomes (PLO):										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.										

	Course Learning Outcomes (CLO):															
				Upon	compl	npletion of the course, the students should be able to:										
				CLO1	Def psy	ine, fi cholog	rame gical a	and nd e	prese motio	ent p nal n	roble eeds	ems c of us	or ideas l ers (PLO	based on the 4, C2)	e implicit,	
				CLO2	Imp app	lemer roach	ntat tocre	eam ate h	-base numa	ed thi n-cen	nkin tere	g and d prod	d a rapio ducts and	d iterative p services (PL	ototyping 07, C3)	
				CLO3	Pre	sent a	and co s. (PL)	omm 08. (unica C6)	te ide	eas	effect	ively that	engages an	d excites	
9.	Mapping of Methods a	of the	Cour	se Lea ment:	arning) Outo	comes	s to t	the F	rogra	amm	ing L	.earning	Outcomes, ⁻	Feaching	
	Course		F	Program	me Lea	arning (Dutcom	es (P	(PLO)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	7 PLC	D8 PL	09	Teach	ing Method	ls Assess	sment	
	CLO1				3							Lecture Practic	e, Tutori al	al, Quiz, As Presentation examination	Quiz, Assignment, Presentation, Final examination	
	CLO2							3				Lecture Practic	e, Tutori al	al, Quiz, As Project, Pre	ssignment, esentation	
	CLO3								3			Lecture	e, Practical	Quiz, As Project, Pre	ssignment, esentation	
40	Note: 1 = Little	e Contri	bution;	2 = Moc	lerate C	Contribu	tion; 3 =	= Stroi	ng Cor	ntributio	on					
10.	(if applical	(if applicable): Problem S Social Skill						Scier nsibil	ntific lities	Skills	; Ma	anage	rial and	Entrepreneur	ial Skills;	
11.	Distributio	rning	Time	(SLT)	:											
								0	T	eachin	g and	Learn	ning Activiti	es Indenendent	Total	
	Cοι		CL	0	L	T	P	0	Ľ	earning (NF2F)	Learning (NF2F)	SLT				
	I. Introduction to Design Thinking Background & Concept Purpose					1		1	1					2	4	
	2. Design T Methodo	hinking logies	Proce	ess &												
	HumanProbler	n-centere m-solvin	ed desi Ig	ign conce	ept	1,	2	1	1					2	4	
	Design Secondary	ing solu	tions													
	 Intervie 	w & Ob	e servati	on			_									
	Inferen	ce & Ins	sight de	evelopme	ent	1,	2	1		1			1	1	4	
	Custom	ner need	ds anal	ysis							-					
	Synthe to identicated by the state of t	size obs tify root je points	servatio proble 3.	ons & infe ms, caus	erences ses and	1,	2	1		1			1	1	4	
	Transla	ating and	d mapp	bing												
	Brainst in creat Team-t	age orming tive thin based b	princip king rainsto	les and	efficacy	, 1, 1	2	1		1			1	1	4	
	Narrow implem	ring so ientatior	lutions	optimiz	zed for											
	implementation 6. Prototype Stage Physical design, logic design, and systems design Bapid & virtual prototyping				in, and	2		1		1			1	1	4	
	Fabrica design	ation of	parts	& valida	ation of	:										
	 7. Validate \$ Testing Presen partner 	Stage ideas v tation s	with sta to s	akeholde takehold	rs ers &	2		1		1			1	1	4	
	8. Introduct Sharing Importa	t ion to F g ideas ance of s	Pitchin story-te	g Skills elling		1,	3	1	1					2	4	

-					1									
	TED-style presentati	ion overview												
	9. Structuring ideas	un ida a a O	4.0	4		4			0	4				
	Vvnat are ideas & yo Determine through-li	ine & theme	1, 3	1		1			2	4				
	10. Crafting talk plan													
	Create talk plan & m	ethod	3	1		1		1	1	4				
	 Scripting talk & impresentation 	ovising												
	11. Voice and Presence													
	Using voice & bo	dy language to	3	1		1		1	1	4				
	enhance impact	audianaa												
	12. Storytelling	audience												
	Strategies on how &	when to conduct	1, 3	1		1		1	1	4				
	compelling stories													
	13. Talk Tools 1													
	Explanation		3	1		1		1	1	4				
	Persuasion 14 Talk Tools 2													
	Revelation		3	1		1		1	1	4				
	Visuals													
		Tot	tal (SLT)	14	3	11		10	18	56				
	Continuous					Porco	ntago (%)		Total					
							10		SLT					
	1. QUIZ						10		5					
	3 Project			10										
	4. Drocontation			20										
								20		Total				
	Final As	sessment		Percentage (%)										
	5. Final Examination				8									
		Tot	tal (SLT)				1	00%		24				
								GRAN	ID TOTAL SLT	80				
	L = Lecture, T = Tutorial, P	= Practical, O = O	thers, F2F	= Face	e to Fac	e, NF2F	= Non	Face to Face						
12.	Identify special													
	requirement or	Must conduct	t a Make	er/Hac	kathor	n event	and ⁻	TED Masterc	lass.					
	resources to													
	deliver the course:													
13.	References:	Main reference	<u>ces:</u>		_									
		 Lewrick, 	M. (202	20). TI	he De	sign T	hinki	ng Toolbox.	Wiley. ISBN	-13: 978-				
		11196291	91											
		• IDEO (20	015). Th	e Fiel	d Guio	le to ⊢	luma	n-Centred De	esign. IDEO.c	org ISBN:				
		978-0-992	14063-1	-9										
		, C. (20	18) TE	ED Tal	ks: The	e Offi	cial TED Gui	de to Public S	Speaking.					
		John Mur	ray Pres	s. ISE	3N-13:	978-1	4722	28062						
		erences	<u>:</u>											
		, M. (20 ⁻	18). TI	his is S	Service	Desi	gn Doing. O'	Reilly Media.	ISBN-13:					
		927182.	2.											
		d, T. (2017).	. Inno	ovation	by	Design. We	eiser. ISBN-	13: 978-					
		167.												
14.	Other additional													
1														
	Information:													

1.	Course Name	Co-curi	Co-curriculum												
2.	Course Code	MPU34	12												
3.	Academic Staff Name(s)	Rahma	ıt Aidil Dju	bair											
4.	Rationale for the inclusion of the Course in the Programme	To prov commu importa and qua built an and tec	vide platfo inication w ant of disci alities of the d therefor chniques o	rms for st vhile strer ipline. Thi he studen re will able of awaren	tudents in ngthened a rough invo nts such a to expose ess of life	order to apply sof ability to follow rule olvements of the si s teamwork, self-c se student with dive long learning.	t skills, such as es and realized the rudent, the characteristics onfidence, and others are ersity knowledge, skills								
5.	Semester and Year Offered	Semes	ter 1, Yea	r 1											
6.	Total Student Learning Time (SLT)		Face to Face (F2F)Non Contact (Non F2F)Total Guided and Independent learning												
	L = Lecture T = Tutorial P = Practical O = Others	L O	L T P O 0 0 28 0 ⁵² 80												
7.	Credit Value	2													
8.	Prerequisite (if any)	None													
9.	Course Learning	Upon o	completio	on of this	course, s	students should I	be able to:								
	Outcomes (CLOS)	CLO1	Demons (C3, PL0	strate high O4)	n level of c	discipline and adhe	ere to rule and regulations.								
		CLO2	Demons activities	strate abili s organize	ity to com ed. (C3, P	municate effective LO8)	ly through participation in								
10.	Transferable Skills		Skills		Develo	pment Methods	Assessment Methods								
		Probler Scientif	m Solving fic Skills	and	Project- Solving	based Problem	Return Report								
		Social S Respor	Skills and nsibilities		Coopera Collabo	ative and rative Learning	Presentation								
11.	Teaching-learning and Assessment	Teac	Teaching-Learning Assessment Strategy MQF LO Domain Strategy												
	Strategy	Cooper Collabo	Cooperative and Collaborative LearningEvent Participation, Return Report, PresentationSocial Skills and Responsibilities												
		Project Solving	-based Pr	oblem	Return r	report	Problem Solving and Scientific Skills								

12.	Synopsis	Students learning of Students This allow written, p the unive well-diver	Students participate in university's events to gain opportunity of training and learning of specific techniques and skills related to the themes of the events. Students are also encouraged in helping to organize events for the university. This allows students to practice effective communication skills, both verbally or written, polish managerial skills while becoming leaders and managing events in the university, and cultivate awareness of lifelong learning while exposing to well-diversify of knowledge, skills and techniques.											
13.	Mode of Delivery	Cooperat	tive	and Collaborative Learni	ng, Project-based	Problem Solving								
14.	Assessment			%										
	Methods and Types	Final Exa	mir	nation		0								
		Continuo	us /	Assessment		100								
				Continuo	us Assessment									
		CLO		Teaching-learning Strategy	Assessment	%								
		1, 2		Cooperative and Collaborative Learning	Event Participation, Return Report, Presentation	50								
		1, 2		Project-based Problem Solving	Return report	50								
15.	Mapping of the	The obje	ctiv	ves of the programme a	of the programme are:									
	Programme Aims	PEO 1	Gi er wi	raduates will be employe ngineering field with good th appropriate attitude er	d or self-employed level of knowledg nabling them to hav	d in relevant software ge and competency skills we successful career								
		PEO 2	Gi co th	raduates will acquire abili Ilaborative working in div rough professional involv	ities for effective co rerse teams, and c ement	ommunication, ontinual development								
		PEO 3	Gi ac pr	raduates will pursue lifelo lvancement of informatio ofessions and related co	ong learning in orde n technology and o ntemporary issues	er to contribute to the computer science								
		Course	;	Program	me Educational (Dbjectives								
		Outcome	g es	PEO 1	PEO 2	PEO 3								
		CLO 1 2												
		CLO 2 3												
		Note: 1 = L	ittle	Contribution; 2 = Moderate Co	ntribution; 3 = Strong (Contribution								

16.	Mapping of the	The learning outcomes of the programme are:												
	Programme Learning Outcomes	PLO 1	Aı pr	oply kno inciples	owledge a s, skills, a	and unde	erstandi ies rela	ng of es ting to S	ssential Software	facts, c e Engine	oncepts eering	З,		
		PLO 2	A	oply the	eoretical p	orinciples	s of Sofi	ware E	ngineer	ing in re	elevanta	areas		
		PLO 3	De pr im la	emonst ovide a plemer rge-sca	rate appr a basis for ntation, e ale softwa	opriate r r analysis valuatior re syster	nethodo s, desig n, maint m	ologies, n, deve enance	models lopmen , and do	, technio t, test a ocument	ques th nd tation of	at f a		
		PLO 4	U: th	se relev inking s	vant techi skills in pi	niques a roblem s	nd dem olving	onstrate	e analyti	cal and	critical			
		PLO 5	Conduct professional and ethical responsibilities in accordance wit ethical and legal principles											
		PLO 6	Fı of	unction a leade	effectivel er or a te	ly both a am mem	s indivio ber	luals ar	ıd in a ç	roup in	the cap	oacity		
		PLO 7	Aı de pr	oply bro emonsti ractice	oad busin rate entre	ess and preneurs	real wo ship ski	rld pers Ils relate	pective ed to so	s daily a ftware e	and enginee	ring		
		PLO 8	C	ommun ommuni	icate effe ity and wi	ectively w th the sc	vith the ociety at	software large	e syster	n develo	opment			
		PLO 9	Aj ca	oply ski areer de	ills and prevelopme	inciples nt	of lifelo	ng learr	iing in b	oth aca	demic a	and		
						Progra	mme L	earning	g Outco	omes				
		Learnin Outcom	e Ig es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9		
		CLO 1					2							
		CLO 2									3			
		Note: 1 = L	ittle	Contribu	tion; 2 = Me	oderate Co	ontributio	n; 3 = Stro	ong Conti	ibution				

17.	Conten	t Outline of the Course and the SL	Tper	Торіс					-
			Stud	lent Le	arning	Time (SLT)		
	Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)	Assessment
	1-14	 Operation of event Assist to organize in-campus activities organize by the university as follows: 1) Taking responsibilities of the specific positions held in the event 2) Communication: discussing and communication 3) Documentation: official writings, letters, reports, meeting minutes, bookkeeping, etc. 4) Problem solving: investigating, observing, monitoring, debugging any problem arise during activities 	-	-	28	-	52	80	Event Participation, Presentation, Return Report
	15	Revision	-	-	-	-	-	-	
	16-17	Examination	-	-	-	-	-	-	
		Total	-	-	28	-	52	80	
		Notional hours			4	0			
		Credit value				2			
18.	Main re • Nil Additio • Nil	ferences supporting the course: nal references supporting the cou	ırse:						

1.	Name of course:	Data St	ata Structure and Algorithms											
2.	Code of course:	CSS31	23											
3.	Synopsis:	This co algorith recursiv languag languag	burse provides the fundamental knowledge about data structure and im, such as primitive data types, pointer, ADT; and algorithms such as ve function, sorting, and searching. The students learn C programming ge which has the syntax that widely affected modern programming ges.											
4.	Name(s) of academic staff:	Chew P	Kim Mey											
5.	Semester and year of offered	Semes	ter 2, Year 1											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	accessful completion of CSS3113 Introduction to Programming											
8.	Learning	Program												
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		Course	Learning Outcomes (CLO):											

				Upon completion of the course, the students should be able to:											
				CLO1	Exp prod	lain th cess tl	ne data he dat	a struc a (C2,	ture a	and alg 1)	gorit	thm on how to	organize and	d	
				CLO2	Dev the	velop p data (orogra C6, Pl	ms tha LO2)	at can	receiv	ve ii	nput, produce	output, and p	process	
				CLO3	Der PLC	nonsti 03)	rate th	ne un	dersta	Inding	of	data structur	e and algori	thm (C3,	
9.	Mapping o Methods a	of the nd As	Cour sess	se Lea ment:	arning	Outo	comes	to th	ne Pro	ogram	mir	ng Learning	Outcomes, 1	Feaching	
	Course Learning Outcomes	PL01	F PLO2	PLO3	PLO4	PLO5	PLO6	es (PL PL07	O) PL08	PLO9	т	eaching Method	s Assess	sment	
	CL01	3									Le	ecture, Tutorial	Progress T Final Exam	Progress Test, Final Examination	
	CLO2		3								Le Pr ba	ecture, Tutoria ractical, Compute ased Learning	al, er- Progress T	t, est	
	CLO3			3							Le Pr ba	ecture, Tutoria ractical, Compute ased Learning	al, er- Final Exam	t, ination	
	Note: $1 = Lit$	tle Con	tributio	n; 2 = Ma	oderate	Contrib	oution; 3	= Stroi	ng Con	tribution	1				
10.	Transferat	ole ski ole):	lls	Knowl	edge;	Practi	ical Sk	tills							
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)		Taa	ahina a	المم	a armina A ativiti			
	Cou	ırse Co	ntent	Outline		CL	CLO Guided Learning (F2F) Guided Independ							Total	
							1	L	т	Р	0	Learning (NF2F)	Learning (NF2F)	SLT	
	1. Introduction Concept Basic typ Primitive Abstract Need of Advantage	on to Da Data S Des of D Data S Data St Data St ges of L	ata Stru tructur data Stru tructur tructure ructure Jsing D	uctures e ructures es e e Data Stru	cture	1,3	3 :	2					2	4	
	2. AlgorithmAlgorithmCharacteElements	& Pseu n Defini eristics of s of algo	docode tion of algo prithm	e rithm		1,3	3 2	2					2	4	
	3. Algorithm • Pseudoo • Difference • Algorithm • Experime • Efficience	& Pseu ode exa ce of Alq ns Anal ental ar y class-	docode ample gorithm ysis : E id theo Big-O-	e a & Pseu Big-O Not retical ar Notation	docode tation nalysis	1,3	3 2	2	2				4	8	
	4. FunctionWhat is fTypes of	unction functio	n			1,2,	,3 :	2					2	4	
	5. FunctionHow functionFunction	ction wo	orks on and	how it w	vorks	1,2	,3 :	2	2				4	8	
	6. Pointer • Pointer E • Pointer v	Basics vith fund	ctions			1,2,	,3	2					2	4	

	 7. Pointer Call by reference Array of pointers & p Programs 	ointer to array &	1,2,3	2		2			4	8
	8. Abstract Data StructureLinked ListStack	9	1,2,3	2					2	4
	9. Abstract Data Structure • Queue • Tree • Graph	2	1,2,3	2		2			4	8
	 10. Sort Algorithms Introduction to Sorting Bubble Sort Insertion Sort Selection Sort)	1,2,3	2		2			4	8
	11. Sort AlgorithmsQuick SortMerge Sort		1,2,3	2		2			4	8
	12. Sort AlgorithmsHeap SortCounting Sort		1,2,3	2		2			4	8
	 13. Search Algorithms Linear Search Binary Search (Traversal, Construction) 	on, search)	1,2,3	2					2	4
	 (Traversal, Construction, search) 14. Search Algorithms Binary Search (Traversal, Construction, search) Jump Search 		1,2,3	2		2			4	8
		Tot	tal (SLT)	28	4	12			88	
				T - 4 - 1						
	Continues	Assessment					Percei	ntage (%)		SLT
	Continues 1. Progress Test	Assessment					Percei	ntage (%) 20		SLT 4
	Continues 1. Progress Test 2. Assignment	Assessment					Percei	ntage (%) 20 30		Iotal SLT 4 18
	Continues 1. Progress Test 2. Assignment Final As	Assessment					Percer Percer	ntage (%) 20 30 ntage (%)		Iotal SLT 4 18 Total SLT
	Continues 1. Progress Test 2. Assignment Final As 1. Final Examination	Assessment					Percer Percer	ntage (%) 20 30 ntage (%) 50		IotalSLT418TotalSLT10
	Continues 1. Progress Test 2. Assignment Final As 1. Final Examination	Assessment sessment Tot	tal (SLT)				Percer Percer	ntage (%) 20 30 ntage (%) 50 00%		Iotal SLT 4 18 Total SLT 10 32
	Continues 1. Progress Test 2. Assignment Final As 1. Final Examination	Assessment sessment Tot	tal (SLT)				Percei Percei	ntage (%) 20 30 ntage (%) 50 00% GRAN	ID TOTAL SLT	Iotal SLT 4 18 Total SLT 10 32 120
	Continues Continues 1. Progress Test 2. Assignment Final As 1. Final Examination L = Lecture, T = Tutorial, P	Assessment sessment = Practical, O = C	tal (SLT) Dthers, F2F	F = Face	e to Face	ə, NF2F	Percei Percei 1 T	ntage (%) 20 30 ntage (%) 50 00% GRAN Face to Face	ID TOTAL SLT	Iotal SLT 4 18 Total SLT 10 32 120
12.	Continues 1. Progress Test 2. Assignment Final As 1. Final Examination L = Lecture, T = Tutorial, P Identify special requirement or resources to deliver the course:	Assessment sessment = Practical, O = C Microsoft Vis	tal (SLT) Others, F2F	= Face	e to Face	ə, NF2F	Percei Percei	ntage (%) 20 30 ntage (%) 50 00% GRAN Face to Face	ID TOTAL SLT	Iotal SLT 4 18 Total SLT 10 32 120
12.	Continues 1. Progress Test 2. Assignment Final As 1. Final Examination L <	Assessment sessment Tot = Practical, O = C Microsoft Vis <u>Main referent</u> • Yashava fundama 388-511 • Robert O Program <u>Additional ref</u> • Jeff Szu program ISBN: 9	tal (SLT) Thers, F2F ual Stud <u>ces:</u> ant Kar entals of 139-1. C. Seaco nming. N <u>ferences</u> thay. (20 nming th 78-1789	F = Face lio f Data ord. (2 No Stat 220). L ie eas 034991	s (20° Struct 020). I rch Pro earn C y and 7.	^{a, NF2F} 19). D ures th Effectivess. IS Progr discip	Percei 1 1 2 = Non Data S Data S	ntage (%) 20 30 ntage (%) 50 00% GRAN Face to Face Structures The C. BPB Pub An Introductio 78-17185010 ing: A beginne way. Packt F	ID TOTAL SLT hrough C: L lications. ISB on to Professi 041. er's guide to le Publishing; 1s	earn the N: 978-9- onal C

1.	Name of course:	Object	bject Oriented Programming									
2.	Code of course:	CSS31	33									
3.	Synopsis:	Unders classes C# or J	tand the concepts of Object Oriented (OO) and able to design the objects, a, and exceptions handling by using OO programming languages, such as ava.									
4.	Name(s) of academic staff:	Ting Hu	uong Yong									
5.	Semester and year of offered	Semes	ter 2, Year 1									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3113 Introduction to Programming									
8.	Learning	Program	gramme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	Communicate effectively with the computing development community and with the society at large, and									
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.									
		Course Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									

				CLO1	Den obje	nonstr ects (C	rate th C3, PL	ie wo .O1)	orking	g prin	ciple	es (of inheritance	and polymo	rphism in
				CLO2	Des	ign ob	ojects,	clas	sses,	and e	exce	ptio	ons handling	(C6, PLO2)	
				CLO3	Solv	ve the	practi	ical p	oroble	ems w	/ith	obj	ect-oriented s	olution (C4, F	PLO4)
9.	Mapping of Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	comes	s to	the F	Progr	amı	min	ng Learning	Outcomes, 1	Feaching
	Course		F	rogram	me Lea	rning (Dutcom	nes (P	PLO)						
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	7 PLO	08 PI	-09	Те	eaching Method	s Assess	sment
	CLO1	3										Le	cture, Tutorial	Progress T Final Exam Assignmen	est, ination, t
	CLO2		3									Le	cture, Tutorial	Progress T Final Exam Assignmen	est, ination, t
	CLO3				3							Pra ba	actical, Compute sed Learning	er- Assignmen	t
	Note: $1 = Lit$	ttle Con	tributio	n; 2 = Me	oderate	Contrib	oution; 3	B = Sti	rong C	ontribu	ition				
10.	Transferat (if applicat	edge;	Proble	em so	lving) and	scien	tific	ski	ills.					
11.	Distributio	n of S	Stude	nt Lea	rning ⁻	Time	(SLT)	:							
		_					_	Guide	T	eachir	ng ar	nd L	earning Activiti	es Indonondont	Total
	C οι	urse Co	ontent (Outline		CL	0	L	T	P		0	Learning	Learning	SLT
	1. Introdu	ction	to Ot	oject C	Driented			_	-			-	(NF2F)	(NF2F)	
	Concepts • Th • Pr Programmin • O	ne Fund rocedura Ig bject an	amenta al d Class	al Conce Versus	pts OO	2		2	1				3		6
	2. Introduc Conceptes - • Er • In • Pro	ction cont. ncapsula heritanc olymorp onstruct	to Ot ation ar ce hism or	oject C nd Data	Driented Hiding	1,2	2	2	1				3		6
	3. Encapsula • W • Be	ation 'hy enca enefits	apsulati	on?		2		2		1				3	6
	4. Encapsula • Da • Da	ation - c ata men ata func	ont. nbers tions			2		2		1				3	6
	5. Encapsula • As	ation - c ssess S	ont. pecifics	6		2		2		1				3	6
	6. Inheritance • Ba	e ase and	Derive	d Classe	es	1		2		1				3	6
	7. Inheritanc • At • Pi	ce - cont ostract a otected	and Sea Memb	aled Clas ers	sses	1		2		1				3	6
	8. Inheritance • Co	e - cont	:. or in D	erived C	lass	1		2		1				3	6
	9. Polymorp • St • D	hism atic Pol ynamic	ymorph Polymc	nism orphism		1		2		1				3	6
	10. Polymor • M • M	phism – ethod O ethod O	- cont. Verridir Verload	ng ding		1		2		1				3	6
	11. Polymor • Vi	phism – rtual	cont.			1		2		1				3	6

	Shadowing									
	12. Exception Handling • Overview of Exceptions in C	ception Handling	2	2		1			3	6
	 13. Exception Handling Exceptions Classing Catching Exception 	sses otions	2	2		1			3	6
	14. MVC ArchitectureIntroduction to I	MVC architecture	2	2	1			3		6
		Tot	al (SLT)	28	3	33	84			
	Continues	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							10		2
	2. Assignment							50		22
	3. Presentation							10		2
	Final As	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination							30		10
		Tot	al (SLT)				1	00%		36
	L – Lecture, T – Tutorial, P	- Practical O - O	thers E2E	- Face	to Fac	NE2E	– Non	GRAN	ID TOTAL SLT	120
40			uici3, i 2i	-1400		5, 111 21	- 11011			
12.	requirement or resources to deliver the course:	An object-orie	ented pr	ogram	ming i	ntegra	ted de	evelopment e	nvironment	
13.	References:	<u>ces:</u> I, M. (2 -Wesley J. (2017) ming. C <u>erences</u>	2019). Profe Micro engag	The ssiona osoft v e Lea	object al. ISBN risual C rning. I	-orien N: 978 C#: an SBN:	ted thought 3-0-135-1819 introduction 978-1-337-1	process (5 th 6-6. to object-orie 0210-0.	edition), nted	
		 Balaguru India: T 9383286 	isamy, E Tata Mo 508.	=. (201 cGraw	I3). Ol Hill	bject C Educ	riente ation	ed Programm Private Lin	ing with C++ nited. ISBN-	(6th Ed.). 13: 978-

1.	Name of course:	Calculu	Calculus								
2.	Code of course:	CSS32	23								
3.	Synopsis:	This co can be	burse provides the students the concept and practical use of calculus that used in research and development of Computer Science.								
4.	Name(s) of academic staff:	Yiiong	Siew Ping								
5.	Semester and year of offered	Semes	ter 2, Year 1								
6.	Credit value:	3									
7.	Prerequisite/co- requisite (if any):	None									
8.	Learning	Program	mme Educational Objectives (PEO):								
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.								
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.								
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.								
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:								
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and								
		PLO2	Apply theoretical principles of computer science in relevant areas, and								
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and								
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and								
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and								
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and								
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and								
		PLO8	Communicate effectively with the computing development community and with the society at large, and								
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.								
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:								
		CLO1	Demonstrate the rules and techniques relevant to differentiation or involved in differentiation of scalar functions of one variable (PLO2, C3).								

				CLO2	Dem func	nonstr tions	ate th of one	ie ru e vai	ules a riable	nd te or re	echr leva	niqu ant t	es involved i o integration.	n integration (PLO2, C3)	of scalar
				CLO3	Derr com	nonstr	ate th g. (PL	ne a O3,	applica C3)	ation	of	inte	gral and de	rivative in the	e field of
9.	Mapping of <u>Methods</u> a	of the nd As	Cour	se Lea nent:	arning	Outc	omes	s to	the F	Prog	ram	min	g Learning	Outcomes, 1	Feaching
	Course		P	rogram	me Lea	rning C	Outcom	ies (F	PLO)						
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLC	D7 PL	08 P	LO9	Te	eaching Method	ls Assess	sment
	CL01	3										Le	cture, Tutorial,	Progress T Assignmen Examinatio	est, t, Final n
	CLO2	3										Le	cture, Tutorial,	Assignmen Examinatio	t, Final n
	CLO3			3		0 / 1						Le	cture, tutorial,	Assignmen Examinatio	t, Final n
	Note: $1 = Li$	tle Con	tributior	$1; 2 = M_0$	oderate	Contrib	ution; 3	s = St	rong C	ontribi	ution				
10.	Transferat (if applical	ole ski ole):	lls	Knowl	edge;	Practi	cal Sk	kills.							
11.	Distributio	n of S	tuder	nt Lea	rning T	Time ((SLT)	:							
					<u></u>	T	eachi	ng ar	nd L	earning Activiti	es Indonondont	Total			
	Cor	urse Co	ntent C	Dutline		CLO		Guia	ed Lea	irning	(F2F	.) 0	Learning	Learning	SLT
	1 Functio	no 1						L		Г	_	0	(NF2F)	(NF2F)	
	 Functions 1 Functions and Graphs Combining Functions 					1	:	2	2					2	6
	2. Functio	ons 2 igonom kponent	etric Fu ial Func	nctions		1	:	2	2					2	6
	3. Limits a • Ri to • Li La • O In	& Contir ates of Curves mits of aws ne-sideo finity	nuity 1 Change a Fund d Limits	e and Ta ction an s and L	angents Id Limit imits at	1	:	2	2					2	6
	4. Limits a In As Ca Ta Po	& Contir finite symptote ontinuity angents pint	nuity 2 Limits es , and D	and Perivative	Vertical es at a	1	:	2	2					2	6
	5. Differen • Di • Di Provent	ntiation erivative ifferentia olynomia roducts,	1 e of a Fu ation als, and Qu	unction Rules Expon	for entials,	1	:	2	2					2	6
	6. Differen • Di Fu • Ci • In	ntiation erivative unction hain Rul nplicit Di	2 e of a le ffe <mark>rentia</mark>	Trigon ation	ometric	1	:	2	2					2	6
	7. Applica • E: • M • M • M Fi	ations of ktreme \ ean Val onotonic rst Deriv	Derivat /alues o ue Theo c Func /ative T	tives 1 of Funct orem tions a est	ions nd the	3	:	2	2					2	6
	8. Applica • C	ations of oncavity	Derivative of the derived of the derived and the derived of the de	tives 2 urve Ske	etching	3	:	2	2					2	6

	 Applied Optimiz 	zation								
	 9. Integration 1 Estimating the F Sigma Notation Finite Sums The Definite Integration 	Finite Sums n and Limits of egral	2	2	2				2	6
	 10. Integration 2 The Fundamer Calculus Indefinite Inte Substitution Rul Substitution and Curves The Logarithm Integral 	ntal Theorem of grals and the le d Area Between Defined as an	2	2	2				2	6
	 11. Applications of Defin Volumes by Slice about an Axis 	ite Integrals cing and Rotation	3	2	2				2	6
	12. Applications of DefinVolumes by Cyl	ite Integrals lindrical Shells	3	2	2				2	6
	 13. Techniques of Integr Integration by P Trigonometric Integration 	ation Parts ntegrals	2	2	2				2	6
	 14. Techniques of Integr Trigonometric S Integration of Raby Partial Fraction 	ation Substitutions ational Functions ions	2	2	2				2	6
		Tot	al (SLT)	28	28	-	-	-	28	84
					•					
	Continues	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							20		4
	2. Assignment							30		20
	Final Ass	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination							50		12
		Tot	al (SLT)				1	00%		36
	L – Locturo, T – Tutorial, P	- Practical O - O	thore E2E	- Eaco	to Fac		- Non	GRAN	ID TOTAL SLT	120
		= Flactical, $O = O$	111015, 1 21			5, INF 21				
12.	Identify special requirement or resources to deliver the course:	None								
13.	References:	Main reference Joel et a Pearson Rober, Transce <u>Additional ref</u> Larson & Edition. IS Larson &	<u>ces:</u> al., (201 ndental <u>erences</u> Edwar SBN: 97 Edward	9). Ur Rola Functi ds (20 81337 Is (201	niversit nd, M ons, 5 019). ⁻ 78244 [8). Ca	y Calc 1., & th Edit Fransc 9 Iculus.	ulus: Ziad ion. M ender	Early Transo , Rafhi (20 IcGraw-Hill E ntal Function V: 978133727	cendentals, 4 18). Calculu ducation s, Internation 75347	^h Edition, ıs: Early ıal Metric
14.	Other additional									

1.	Name of course:	Multime	ultimedia Technology									
2.	Code of course:	CSS33	13									
3.	Synopsis:	This co to deve especia	burse provides the theoretical knowledge and practical techniques related eloping interactive multimedia application and how multimedia works ally world wide web as a multimedia technology.									
4.	Name(s) of academic staff:	Marcell	a Peter									
5.	Semester and year of offered	Semes	ter 2, Year 1									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	None										
8.	Learning	Program	mme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		Program Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale software system									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	Communicate effectively with the software system development community and with the society at large									
		PLO9	 Apply skills and principles of lifelong learning in both academic and career development 									
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									

				CLO1	Ana mul	Analyse and explain various technologies involved to support multimedia application development (C4, PLO1)									
				CLO2	Buil (C6	d inte , PLO	ractive 3)	e mult	timed	lia ap	plic	ation such as m	iontage and a	animation	
				CLO3	Solv mul	/e mu timedi	ltimed a proc	ia pro ducts	oject ((C4,	deve PLO	lopr 7)	ment problems a	and to market	the	
9.	Mapping of Methods a	of the nd As	Cour	se Lea	arning	Outo	omes	s to t	he P	rogr	amı	ming Learning	Outcomes,	Teaching	
	Course		F	Program	me Lea	rnina (Dutcom	es (Pl	0)						
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	8 PI	-09	Teaching Method	ds Asses	Assessment	
	CLO1	3										Lecture, Tutorial	Progress ⁻ Final Exar	Test, nination	
	CLO2			3								Lecture, Tutor Practical, Comput based Learning	ial, er- Progress	nt, Γest	
	CLO3							3				Practical, Compute based Learning	er- Presentati	on	
	Note: $1 = Lit$	tle Cont	tributio	n; 2 = Ma	oderate	Contrib	oution; 3	B = Stro	ong Co	ontribu	ition				
10.	Transferat (if applicat	edge;	Practi	ical Sk	kills; N	lana	geria	ıl ar	nd Entrepreneuri	al Skills					
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:							
									Те	achir	ng ar	nd Learning Activit	ies		
	Cou	urse Co	ntent (Outline		CL	0	Guide	d Lear	ning	(F2F) Guided Learning	Independent Learning	Total SLT	
									Т	Р	'	O (NF2F)	(NF2F)		
	1. Overview - Definitio - HyperTe - Commun Transfer - Human (- Compon - Scope o - Characte - Challeng - Desirabl System - Multimed - Trends i	Course Content Outline 1. Overview of Multimedia Technology - Definition of Multimedia - HyperText and HyperMedia - Communication and Information Transfer Model - Human Computer Communication - Components of Multimedia System - Scope of Multimedia - Challenges for Multimedia Systems - Desirable Features for a Multimedia System - Multimedia in our Daily Life Transfe Multimedia											2	4	
	2. Interaction - Human-(- Human-(- Input Te - Output T	n Techn Comput Comput chnolog Technolo	ologies er Inter er Inter ies ogies	s and De rface raction D	vices vesign	1,2	2	2	2				2	6	
	 Multimedi Technology Analogu Multimedi Propertiei Multimedi Hardwari Multimedi Hardwari Multimedi Storage 	ns, and ns ly vgy	1,2	,3	2	2				4	8				
	 4. Multimed Audio Characte Graphic/ Structure Raster a Basics o 	dia Data eristics o Image I es nd Vect f Digital	a: Text of Text File Fo or Gra Audio	, Graphi rmats ar phics	cs, and	1,2,	3	2					2	4	
 5. Multimedia Data: Animation and Video - cont. Basics of Colour CIE Chromaticity Diagram Colour Image and Video Representations Creating Animations Basics of Video: Types of Colour Video Signals, Analogue Video, Digital Video, Chroma Subsampling 	1,2,3	2	2			4	8								
--	-------	---	---	---	--	---	---								
 Multimedia Project Development Multimedia Application Design: Content Design, Technical Design, Visual Design Development Metaphors Multimedia Project Planning Editors: Text, Image, Animation, 3D Animation, Sound, Video 	1,2,3	2				2	4								
 7. Multimedia Project Development -cont Development Methodology: Analysis and Design, Content Creations, Maintenance, Functionality and Navigation, Usability and Testing Marketing Multimedia Product Legal Issues 	1,2,3	2		2		4	8								
 8. Multimedia Authoring, Programming, and Scripting Multimedia Authoring: Systems and Applications Definition of Authoring System Reasons of Using an authoring System Multimedia Authoring Paradigms Multimedia Programming vs Multimedia Authoring Multimedia Programming and Scripting Technologies Types of Scripts Web-Based Multimedia Technologies 	1,2,3	2		2		2	6								
 9. WWW and Web-Based Multimedia Web Applications Development Web-based Applications: E-Learning, E-Commerce, E-Government, E- Entertainment 	1,2,3	2		2		2	6								
 10. WWW & Web-Based Multimedia- cont Online and Web Issues: Harmful Information and Communications, Plagiarism and Copyrights, Cyber Crime and Security 	1,2,3	2		2		4	8								
 11.Multimedia Communications & Compressions Multimedia Communications Multimedia Networks Multimedia Compressions 	1,2,3	2				2	4								
 Emerging and Advanced Multimedia Applications Human Aspect of Computing Animated Agent and Avatar Advanced Multimedia Learning Bioinformatics and Health Computing Massively Multiplayer Online Gaming (MMOG) Web 2.0, Mashups, and Social Networking Voice and Face Recognition Home and Entertainment Computing Wireless and Mobile Multimedia Communications 	1,2,3	2				2	4								
13. Emerging and Advanced Multimedia Applications - cont.	1,2,3	2				2	4								

	 Advanced Multimedia Virtual and Augmente Applied Artificial Intelli GIS and Geog Processing Industrial computing Robot Interaction Web Data Mining Discovery Visualisation for Information Retrieval 3D Graphical Display 3D Modelling and Red 14. Multimedia Future Diri Computing without Kee Web 3.0 and Semanti Wearable Computing Devices Genetic Algorithm a Computation Natural Human Comp Personal Area Networi IP Address and Home RFID and Microwave 	Applications d Reality gence raphical Data g and Human and Knowledge Multimedia and Interaction construction ections byboards c Web g and Future nd Evolutionary 1,2,3 uting ks Appliances Communications	2					2	4			
		Total (SLT)	28	8	12			30	78			
	Continues			Total SLT								
	1. Progress Test			4								
	2. Assignment						30		18			
	3. Presentation						10		10			
	Final As	sessment		Total SLT								
	1. Final Examination			10								
		Total (SLT)		42								
	L = Lecture T = Tutorial P	= Practical O = Others E2	E – Face	120								
12.	Identify special requirement or resources to deliver the course:	none			_ ,							
13.	References:	Main references: • Yue-Ling Wong. 9780134054360 • Savage, T. & Vog Burlington, MA: J. • Vaughan, T. (2014) Hill Education. IS Additional references • Chapman, N. & C John Wiley. ISBN • Devlin, I. (2012) California: Peach	 <u>ain references:</u> Yue-Ling Wong. (2016).Digital Media Primer. 3rd Edition. Pearson, ISBN-9780134054360 Savage, T. & Vogel, K. (2013). An Introduction to Digital Multimedia (2nd Ed.). Burlington, MA: Jones & Bartlett Learning. ISBN-13: 978-1449688394. Vaughan, T. (2014). Multimedia: Making it Work (9th Ed.). New York: McGraw-Hill Education. ISBN-13: 978-0071832885. <u>dditional references:</u> Chapman, N. & Chapman, J. (2009). Digital multimedia (3rd Ed.). Chichester: John Wiley. ISBN-13: 978-0470512166. Devlin, I. (2012). HTML5 Multimedia: Develop and Design. Berkeley, 2005. 									
14.	Other additional information:	None										

1.	Name of course:	Databa	se Development and Applications										
2.	Code of course:	CSS33	23										
3.	Synopsis:	This co databas implem	purse provides the students the knowledge about the normal SQL based- se, blockchain technology, NoSQL based-database and the rentation of these databases technology usage in applications.										
4.	Name(s) of academic staff:	Gary Lo	oh Chee Wyai										
5.	Semester and year of offered	Semes	ter 2, Year 1										
6.	Credit value:	3											
7.	Prerequisite/co- requisite (if any):	None	one										
8.	Learning	Program	mme Educational Objectives (PEO):										
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		<u>Prograi</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.										
		<u>Course</u> Upon c	<u>Learning Outcomes (CLO):</u> ompletion of the course, the students should be able to:										

				CLO1	Ana data	ilyse abase	the fu syste	undar ms co	nenta oncep	als o ot and	f S d de	QL esig	., blockchain ın (C4, PLO1) ar	nd NoSQI	based-
				CLO2	Cor top-	nstruct ∙down	the c or bot	lesigr tom-	n of \$ up, a	SQL, nd ap	blo ply	cko the	chain and No e use of it (C6	oSQ 6, P	L based-c LO4)	latabase,
				CLO3	Valu use	ue the d in th	e impo ie app	rtanc licatio	e of on sy	all th stem	e d s (C	ata 25,	base system PLO9)	is a	nd how it	is widely
9.	Mapping o Methods a	of the nd As	Coui	rse Lea ment:	arning	Outo	comes	to t	he P	rogra	amr	min	g Learning	Ou	tcomes, 1	eaching
	Course		I	Program	me Lea	rning (Outcom	es (Pl	.0)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	8 PL	.09	Te	eaching Method	ls	Assess	sment
	CLO1	3										Le La	cture, Tutorial b	&	Progress To Assignmen Exam	est, t, Final
CLO2 3 Lecture, Tutorial & Lab								Progress To Assignmen Exam	est, t, Final							
	CLO3									:	2	Cc Le	mputer-based arning		Assignmen	t
	Note: $1 = Lit$	tle Cont	tributio	n; 2 = Me	oderate	Contrib	oution; 3	= Stro	ong Co	ontribu	tion					
10.	Transferab (if applicab	ole ski ole):	lls	Knowl Lifelor	edge; ng Lea	Probl	em so Skills	olving	and	scie	ntifi	c s	kills; Informa	tior	n Manager	ment and
11.	Distribution of Student Learning Time (SLT):															
									Τe	achin	g an	nd L	earning Activit	ies		
	Cou	ırse Co	ntent	Outline		CL	o _ (Guide	d Lear	ning	(F2F)	Guided	Inc	dependent	Total SI T
				1	L	т	Р	0	0	(NF2F)		(NF2F)	•=-			
	1. Overview	of Data	bases													
	SQL backs	ased-da	atabas	e		1,2	2 2	2	1						3	6
	NoSQI	_ based	-datab	yy ase												
	2. Relational	Model														
	Data M Data M	lodel				1,2	2 2	2	1						3	6
	Relatio Selectedation	nai data n Model	abase								-					
	Hashin Diotribu	ng meth	od Igor to	obbology		1,2	2 :	2	1						3	6
	Distribute A NoSOL m	odel	iger te	chhology												
	Data N Docum	lodel 1ent-Ori	ented	DB		1,2	2	2	1						3	6
	5. Database	Design														
	 Logica Physic 	l Databa al Datal	ase De base D	esign Desian		1,2	2 :	2		1					3	6
	Top-Do	own vs	Botton	n-Up Des	sign											
	6. Structured Query Language (SQL) • Create, Read, Update & Delete (CRUD) queries				L) Delete	1,2	2	2		1					3	6
	 7. Structured Query Language (SQL) Create, Read, Update & Delete (CRUD) queries 				L) Delete	1,2	2	2		1					3	6
	8. Blockchain platformSmart Contracts					1,2	2	2		1					3	6
	9. Blockchain platform • Smart Contracts					1,2	2 2	2	1						3	6
	Smart Contracts 10. NoSQL JSON format Create, Read, Update & Delete (CRUD) queries					1,2	2	2		1					3	6

	11. NoSQL JSON format • Create, Read, Up (CRUD) queries	odate & Delete	1,2	2	1				3	6		
	12. Applications of DatabaInformation system	ase	1,2	2		1			3	6		
	13. Applications of BlockoWeb Applications	hain	1,2	2	1				3	6		
	14. Applications of NoSQIMongoDB	L Database	1,2	2		1			3	6		
		Tot	Total (SLT) 28 7 7 42									
	Continues	Assessment		Percentage (%)								
	1. Progress Test					4						
	2. Assignment							40		22		
	Final As	sessment			Total SLT							
	1. Final Examination							40		10		
		Tot	al (SLT)	100% 36								
	L – Lecture, T – Tutorial, P	GRAND IOTAL SLT 120 Others, F2F = Face to Face, NF2F = Non Face to Face										
12.	Identify special requirement or resources to deliver the course:	Computer an	d NEM d	offline	blockc	hain p	latfori	m				
13.	References:	Main reference Silbersce Ed.). Mo 1260084 Peter M Apress. Daniel E 1484226 Additional ref Taylor, 978-111 Sadalage Emergin Wesley.	 Main references: Silberschatz (2020). ISE eBook Online for Database System Concepts Ed.). McGraw-Hill Higher Education (International). ISBN: 9781260084 1260084507 Peter Membrey; David Hows; Eelco Plugge (2014). MongoDB Ba Apress. ISBN: 9781484208953, 1484208951. Daniel Drescher (2017). Blockchain Basics. Apress. ISBN:9781484226 1484226046 Additional references: Taylor, A. (2013). SQL for Dummies (8th Ed.). Hoboken: Wiley. ISB 978-1118607961. Sadalage, P. & Fowler, M. (2013). NoSQL Distilled: A Brief Guide t Emerging World of Polyglot Persistence. Upper Saddle River, NJ: Additional Participant Provided Pro									
14.	Other additional information:											

1.	Name of course:	Operat	erating Systems										
2.	Code of course:	CSS35	33										
3.	Synopsis:	To prov how the	vide the students the fundamental concepts of Operating System (OS) on e OS manage the hardware and software.										
4.	Name(s) of academic staff:	Gary Lo	oh Chee Wyai										
5.	Semester and year of offered	Semes	ter 2, Year 1										
6.	Credit value:	3											
7.	Prerequisite/co- requisite (if any):	None	None										
8.	Learning	Progra	mme Educational Objectives (PEO):										
	outcomes:	PEO1	EO1 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	O2 Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		Program	mme Learning Outcomes (PLO):										
			Apply knowledge and understanding of acceptial factor concepts										
		FLOI	principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	LO9 Apply skills and principles of lifelong learning in both academic and career development.										
		<u>Course</u> Upon c	<u>Learning Outcomes (CLO):</u> ompletion of the course, the students should be able to:										

			C	LO1	Explai syster (C2, F	Explain the basic functions and concepts that are common to all operating systems such as mobile, workstation, server, embedded and hypervisor (C2, PLO2)									
			С	LO2	Show cloud	the co compu	mman ıting (C	d usag 3, PL	ge of o O3)	perati	ng systems,	virtual	machine	and	
			C	LO3	Prese softwa	nt the are and	importa d hardv	ance c vare ((of the c C3, PL	operat .09)	ing system a	is the ii	nterface b	between	
9.	Mapping of Methods an	the C	ourse essme	e Lear ent:	ning (Outco	mes to	o the	Progr	amm	ing Learnin	g Out	comes, T	Feaching	
	Course Learning			Prograi	nme Le	arning (Outcom	es (PLC) 		Teachi	ng			
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PL08	PLO	9 Metho	ds	Asses	sment	
	CLO1 3										Lecture & T	utorial	Progress Assignme Exam	Test, ent, Final	
	CLO2 3										Lecture & T	utorial	Progress Test, Assignment, Final Exam		
	CLO3									3	Lecture, T Assignment Computer Learning	utorial, & & Based	Assignme	ent	
	Note: 1 = Little	e Contrib	ution; 2	? = Mode	erate Co	ntributic	on; 3 = S	trong C	ontribut	ion					
10.	Transferable skills (if applicable): Knowledge; Practical Skills; Information Management and Lifelong Learning Skills														
11.	11. Distribution of Student Learning Time (SLT):														
				l'in e			Guid	ed Lea	Feachin rning (F	g and 2F)	Learning Activ Guided	ities Inde	pendent	Total	
	Cours	se conte	ent Out	iine		CLU	L	т	P	0	Learning (NF2F)	Lea (N	arning IF2F)	SLT	
	 Introduction Operating System Machine Hate Types of Op Linux and Up 	n to Opera ystem So rdware erating S nix-like	ating S oftware system	ystems		1,2	2	1					3	6	
	Linux and Unix-like 2. Introduction to Operating Systems - cont. Operating Systems Mobile device OS Workstation OS Server OS Embedded OS - Firmware Interactions (Turns 4)				ns -	1,2	2		1				3	6	
	3. Memory Management • Single User Contiguous Scheme • Fixed Partitions • Dynamic Partitions • Best Fit and First Fit • Deallocation					1,2,3	2		1				3	6	
	 4. Memory Management - cont. Relocatable Dynamic Partitions Paging Policies and Concepts (FIFO, LRU,MRU) Segmented Memory Virtual Memory Cache Memory 				IFO,	1,2,3	2		1				3	6	
	5. Processor I • Job Schedul • Process Sch	Managem ling and F lieduler (F	nent Process PCB an	s Schedi d Queui	uling ng)	1,2	2		1				3	6	
	6. Processor I	Managem	nent - c	ont.		1,2	2		1				3	6	

-														
	Process Scheduling Algorithms Interrupts	Policies and												
	7. Process ManagementDeadlockModelling Deadlock		1,2	2		1			3	6				
	8. Process Management • • Starvation	- cont.	1,2	2		1			3	6				
	9. Concurrent Processes • Parallel Processing • Synchronization Soft WAIT SIGNAL, Semapho	ware (Test-Set, vres)	1,2,3	2	1				3	6				
	10. Concurrent Processes • Process Cooperation • Concurrent Programmin	s - cont. ng	1,2,3	2		1			3	6				
	11. Device Management • System Devices • Storage Media: Seque Access	ential and Direct	1,2	2	1				3	6				
	12. Device Management • Components of I/O Sub- • Communications Among • Management of I/O Reg	1,2	2		1			3	6					
	 13. File Management The File Manager (Wir like) Interacting with File Mar File Organisation Physical Storage Alloca 	1,2	2	1				3	6					
	 14. File Management - cc Data Compression Access Methods Levels in a File Manage Access Control Verificat 	1,2	2		1			3	6					
		Tot	tal (SLT)	28	4	10	-	-	42	84				
	Continues	Assessment		Percentage (%)										
	1. Progress Test							20		4				
	2. Assignment							40		22				
	Final As	sessment				l otal SLT								
	1. Final Examination	Та						40		10				
		10			_	_	_	100% GR		120				
	L = Lecture, T = Tutorial, P	= Practical, O = C	Others, F2	= Face	e to Fac	e, NF2F	= Nor	Face to Face		.20				
12.	Identify special requirement or resources to deliver the course:	Operating System media - Windows, Linux, Mobile, Workstation, Server, Emb and Hypervisor												
13.	References:	Main referen • Andrews	<u>ces:</u> s/Dark/M	/est (2	.020).	 <u>Main references:</u> Andrews/Dark/West (2020). CompTIA A+ Core 2 Exam: Guide to Operating Systems and Security. Cengage. ISBN: 9780357108505 McHoes, A. & Flynn, I. (2013). Understanding Operating Systems (7th Ed.). Boston, MA: Cengage Learning. ISBN-13: 978-1285096551. <u>Additional references:</u> Tanenbaum, A. (2014). Modern Operating Systems (4th Ed.). Boston: Pearson. ISBN-13: 978-0133591620. Anderson, T. & Dahlin, M. (2014). Operating Systems: Principles and Practice (4th Ed.). United States: Recursive Books. ISBN-13: 978-0985673529 								

		 Khurana, R. (2011). Operating Systems. New Delhi: Vikas Publishing House. ISBN-13: 978-8125942429.
14.	Other additional information:	None

1.	Course Name	Commu	Communication in the Workplace											
2.	Course Code	UCS31	12											
3.	Academic Staff Name(s)	Nadira	Abdul Rah	man										
4.	Rationale for the inclusion of the Course in the Programme	To prov commu to pract	ide the stu nication fo ice the ski	idents wit r the use Ils learnt.	h the basi in their fut	c knowledge and sl ture career and prov	kills in various forms of vides a platform for them							
5.	Semester and Year Offered	Semest	ter 1, Year	1										
6.	Total Student Learning Time (SLT)		Face to Face (F2F)Non Contact (Non F2F)Total Guided and Independent learning											
	L = Lecture	L	L T P O											
	P = Practical O = Others	28	28 0 0 0 52 80											
7.	Credit Value	2												
8.	Prerequisite (if any)	None												
9.	Course Learning	Upon c	ompletio	n of this (course, si	tudents should be	able to:							
	Outcomes (CLOS)	CLO1	Apply pri misunde tools use	nciples o rstanding ed in work	f technical in a divers place (C3	l and professional co se workplace and ir , PLO8)	ommunication to minimize nportant communication							
		CLO2	Develop application manner	written w on letters (C6, PLO	orkplace i , resumes, 2)	nformation, such as , reports and propos	s formal correspondence, sal, in a professional							
		CLO3	Produce discipline options (scientific es and pro C3, PLO	and techr ofessional 1)	nical forms of writing practices using a v	g encountered in academic ariety of social media							
10.	Transferable Skills		Skills		Develo	pment Methods	Assessment Methods							
		Knowle	dge		Group d Coopera Collabor Problem	iscussion, ative & ative Learning, -based Learning	Presentation, Q & A session, Lecturer Evaluation							
		Social S Respon	Skills and sibilities		Lecture, Coopera Collabor Self-dire	Assignment, ative & rative Learning, rected learning	Progress test, Final Examination, Assignment, Presentation							
11.	Teaching-learning and Assessment	Teac	hing-Lea Strategy	rning	Asses	sment Strategy	MQF LO Domain							
	Strategy	Lecture			Assignm	nent Report, s Test	Knowledge							

					Dessertati	recontation					
					Presentati Examinati	ion, on					
		Discussio	on		Assignme Presentati	nt Report, ion	Knowledge				
		Collabora	ative	Learning	Assignme Presentati Examinati	nt Report, ion, on	Social Skills and Responsibilities				
		Demonst	ratio	n	Presentat	ion	Social Skills and Responsibilities				
12.	Synopsis	This cour providing communi communi proposals presental	rse c a catio catio s an tion.	omprises of ba fundamental on in the workp on. These inclu nd business I	asic knowle exposure place cover ude practic letters, pre	edge and skills in and guide to ring both verbal co ce in conveying io eparing reports,	workplace communication, the various forms of ommunications and written deas and opinions, writing oral communication and				
13.	Mode of Delivery	Lecture, I	Discu	ussion, Collabo	orative Lea	rning, Demonstra	tion				
14.	Assessment			Asses	sment		%				
	Methods and Types	Final Exa	mina	ation			40				
		Continuo	us A	ssessment			60				
					Continuo	us Assessment					
		CLO		Teaching-le Strateg	earning gy	Assessment	%				
		1, 2, 3		Lecture, Discu Collaborative	ussion, Learning	Assignment	30				
		1, 2, 3		Lecture, Disco Collaborative Learning, Demonstratio	ussion, n	Group Project	20				
		1, 2, 3		Lecture		Progress Test	10				
15.	Mapping of the	The obje	ctive	es of the prog	jramme ar	e:					
	Programme Aims	PEO 1	Gra enç wit	aduates will be gineering field h appropriate a	e employed with good attitude ena	l or self-employed level of knowledge abling them to hav	in relevant software e and competency skills /e successful career				
		PEO 2	PEO 2 Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual developme through professional involvement								
		PEO 3	Gra adv pro	aduates will pu vancement of i ofessions and r	ursue lifelong learning in order to contribute to the information technology and computer science related contemporary issues						

		Course Learning	Programme Educational Objectives											
		Cutcom	g es		PEO 1			PEO 2			PEO 3			
		CLO 1						3						
		CLO 2			2									
		CLO 3			2									
		Note: 1 = L	ittle (Contribut	ion; 2 = Mo	derate Cor	ntribution;	3 = Stror	ng Contrib	ution				
16.	Mapping of the	The learn	ning	g outco	mes of t	he progr	amme	are:						
	Programme Learning Outcomes	PLO 1	Ар pr	oply kno inciples	owledge a s, skills, a	and unde nd theori	erstandir es relat	ng of es ing to S	sential fa oftware	acts, co Enginee	ncepts, ering			
		PLO 2	Ap	oply the	oretical p	rinciples	of Soft	ware En	gineerir	ig in rele	evant ar	eas		
		PLO 3	De pr im lai	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system										
		PLO 4	ປະ sk	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving										
		PLO 5	Co et	Conduct professional and ethical responsibilities in accordance with ethical and legal principles										
		PLO 6	Fu a l	Function effectively both as individuals and in a group in the capacity of a leader or a team member										
		PLO 7	Ap de pr	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice										
		PLO 8	Co co	ommun ommuni	icate effe ty and wit	ctively w th the so	ith the s ciety at	oftware large	system	develop	oment			
		PLO 9	Ap ca	oply ski areer de	lls and prevelopment	inciples ont	of lifelon	g learni	ng in bo	th acad	emic an	d		
		Course				Progra	amme L	earnin	g Outco	mes				
		Learnin Outcome	; g es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9		
		CLO 1									3			
		CLO 2			2									
		CLO 3		2										
		Note: 1 = L	ittle (Contribut	ion; 2 = Mo	derate Cor	ntribution;	3 = Stror	ng Contrib	ution				

17.	Content	Outline of the Course and the SL	line of the Course and the SLT per Topic										
			Stuc	lent Le	arning	Time (SLT)						
	Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)	Assessment				
	1	 The Nature of Communication Forms of Communication Communication Process Barriers of Effective Communication Overcoming Communication Barriers 	2	-	-	-	4	6	Progress Test, Assignment, Group Project, Final Examination				
	2	 2. The Communication Environment - cont. Communication Patterns Effective Workplace Relationship 	2	-	-	-	2	4	Progress Test, Assignment, Group Project, Final Examination				
	3	 2. The Communication Environment - cont. Negotiation and Conflict Management Cultural Diversity in the Workplace 	2	-	-	-	2	4	Progress Test, Assignment, Group Project, Final Examination				
	4	 2. The Communication Environment - cont. Cross-Cultural Communication 	2	-	-	-	2	4	Progress Test, Assignment, Group Project, Final Examination				
	5	 3. Proposals Solicited and Unsolicited Proposals Internal and External Proposals 	2	-	-	-	4	6	Progress Test, Assignment, Group Project, Final Examination				
	6	 3. Proposals - cont. Examples of Proposals Formats of Proposals Proposal Writing 	2	-	-	-	4	6	Progress Test, Assignment, Group Project, Final Examination				

7	 4. Short Reports and Long Reports Short Reports: Types, Elements and Planning 	2	-	-	-	4	6	Progress Test, Assignment, Group Project, Final Examination
8	 4. Short Reports and Long Reports - cont. Long Reports: Types, Elements and Planning Approaches to Writing Reports 	2	-	-	-	4	6	Progress Test, Assignment, Group Project, Final Examination
9	 5. Workplace Correspondence: Memos, E-mail and Business Letters Memos E-mail 	2	-	-	-	3	5	Group Project, Assignment, Final Examination
10	 5. Workplace Correspondence: Memos, E-mail and Business Letters - cont. Business Letters: Types and Examples Good-news and Bad-news Letter Persuasive Letter 	2	-	-	-	3	5	Group Project, Assignment, Final Examination
11	 6. Job Application Process Cover Letter Resume Interview Follow-Up 	2	-	-	-	4	6	Group Project, Assignment, Final Examination
12	 7. Technology-enabled Communication in Workplace Technology-based Communication Tools Telephone and Voicemail Facsimile Machines Computers Internet Conferencing Instant Messaging E-mails Groupware 	2	-	-	-	4	6	Group Project, Assignment, Final Examination

	13	 7. Technology-enabled Communication in Workplace - cont. Positive Impact of Technology-enabled Communication Negative Impact of Technology-enabled Communication 	2	-	-	-	3	5	Group Project, Assignment, Final Examination			
	14	 8. Communicating Visually Through Graphics - cont. Effective Visual Communication Purposes of Graphics Major Types of Graphics Constructing Graphics Presenting Graphics 	2	-	-	-	3	5	Group Project, Assignment, Final Examination			
	15	15 Revision		-	-	-	4	4				
	16-17	Examination	-	-	-	2	-	2				
		Total	28	-	-	2	50	80				
		Notional hours	40									
		Credit value				2						
18.	 Main references supporting the course: Searles, G. J. (2014). Workplace Communications: The Basics (6th ed.). Mohawk Valley Community College: Pearson. Raman, M., & Singh, P. (2012). Business Communication (2nd ed.). India: Oxford University Press. Dwyer, J. (2000). The Business Communication Handbook (5th ed.). New York: Prentice Hall, Australia. Additional references supporting the course: Pfeiffer, W. & Adkins, K. (2013). Technical Communication: A Practical Approach (8th Ed.). Boston: Pearson. ISBN-13: 978-0132785785. Lehman, C. & DuFrene, D. (2011). Business Communication (with Teams Handbook) (16th Ed.). Mason, OH: South-Western Cengage Learning. ISBN-13: 978-1133162353. Markel, M. (2012). Technical Communication. Boston. Mass: Bedford/St Martins. ISBN-13: 978- 											

- 0312679484.
- Lasater, I. & Stiles, J. (2010). Words that Work in Business a Practical Guide to Effective Communication in the Workplace. Encinitas, CA: Puddle Dancer. ISBN-13: 978-1892005014.

1.	Name of course:	Statistic	CS											
2.	Code of course:	CSS32	33											
3.	Synopsis:	This co statistic machin statistic	burse provides the students the knowledge of concepts and theories of s such as probability, correlation and regression that is highly used in e learning and data mining, so that the students are able to apply the cal theories into the algorithms.											
4.	Name(s) of academic staff:	Yiiong	Siew Ping											
5.	Semester and year of offered	Semest	emester 1, Year 2											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	None												
8.	Learning	Program	rogramme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Prograr</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	App C3)	Apply and practice using statistical techniques to analyse the data (PLO1, C3).										
				CLO2	Con	struct	simpl	e stat	istica	al moo	dels	to solve proble	ms. (PLO3, C	6)		
				CLO3	Den	nonstr	ate pr	oblen	ns sc	olving	usir	ng statistical tec	hniques (PLC	04, C2)		
9.	Mapping o Methods a	of the nd As	Cours	se Lea nent:	arning	Outo	omes	s to t	he P	rogra	mn	ning Learning	Outcomes, T	Feaching		
	Course		P	rogram	me Lea	rning C	Outcom	es (PL	.0)							
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	8 PLC	99	Teaching Method	s Assess	sment		
	CLO1	3										Lecture, Tutorial,	Progress T Assignmen	est, t		
	CLO2			3								Lecture, Tutorial,	t, ination			
	CLO3	3							Lecture, Tutorial,	Assignmen Final Exam	t, ination					
	Note: 1 = Lit	tle Cont	tributior	n; 2 = Ma	oderate	Contrib	ution; 3	8 = Stro	ng Co	ontributi	ion					
10.	Transferat	ole ski	lls	Knowl	eque.	Practi	cal Sk	rills: F	Proble	em so	lvin	a and scientific	skills			
	(if applicat	ole):		-	euge,			(110, 1		5111 50			okino.			
11.	Distributio	n of S	studer	nt Lea	rning	Time	<u>(SLT)</u>	:	Та	aching		d Loorning Activiti	~~			
	C							Guideo	Teaching a			Guided	es Independent	Total		
	COL		CLO		L	т	P	,	Learning (NF2F)	Learning (NF2F)	SLT					
	1. Introduction								()	()						
	Types of Critical		1		2	-				2	4					
	 Onlical Design 															
	2. Summariz	zing and	Graph	ing Data	a											
	 Freque Histoar 	ncy Dist ams	tributior	IS		1		2	2				2	6		
	Statistic	cal Grap	ohics													
	3. Statistics	for Desc	cribing,	Explorin	ig, Data											
	 Measure Measure 	res of Va	ariation			1		2	2				2	6		
	Measure Explore	res of R	elative ta Anal	Standing	g A											
	4. Probability	y		yolo (EE	,,,,											
	Fundar	nentals				1 3	,	2	2				2	6		
	 Addition Multipli 	cation F	Rule			1,0		2	2				2	0		
	Countir	ng	Distri													
	S. Normal Pi The Sta	andard I	y Distrii Normal	outions Distribu	tion											
	Applica	tions of	Norma	l Distrib	utions	3		2	2				2	6		
	 Samplin Estimat 	tors	Distribu	utions	anu											
	6. Normal Pr	- cont.														
	 Merce Normal 	3		2	2				2	6						
	Assessing Normality															
	 7. Estimates and Sample Sizes Estimating a Population Proportion 							_	0				0	0		
	Estimating a Population Mean: s Known							2	2				2	Ø		
	8. Estimates and Sample Sizes - cont.															
		ung a P	opulatio	Ju wear	i. S NOt	2,3	3	2	2				2	6		
	Estimat	ting a P	opulatic	on Varia	nce											

	 9. Hypothesis Testing Basics of Hypothesis Testing a Claim abo Testing a Claim al Known 	s Testing ut a Proportion bout a Mean: s	2,3	2	2				3	7				
	 10. Hypothesis Testing - a Testing a Claim abo Known Testing a Claim abo 	cont. out a Mean: s Not ut Variation	2,3	2	2				3	7				
	 11. Inferences from Two S Inferences about Two Inferences about Independent Sample 	Samples vo Proportions Two Means: es	2,3	2	2				3	7				
	 12. Inferences from Two S Inferences from Mate Comparing Variation 	Samples - cont. ched Paris n in Two Samples	2,3	2	2				3	7				
	 13. Correlation and Regree Correlation Variation and Prediction 	ession tion Intervals	2	2	1				2	5				
	14. Correlation and RegreeMultiple RegressionModelling	ession - cont.	2	2	1				2	5				
		Tot	al (SLT)	28	24	-	-	-	32	84				
				1										
	Continues	Assessment			Total SLT									
	1. Progress Test							20		4				
	2. Assignment			30										
	Final As	sessment		Percentage (%)										
	1. Final Examination			50										
		Tot	al (SLT)	100%										
					120									
	L = Lecture, T = Tutorial, P	= Practical, O = O	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face						
12.	Identify special requirement or resources to deliver the course:	None												
13.	References:	Main reference Triola, M. Borman, Modeling Essential Additional ref Moore et Bluman, Hill Educ	 <u>Main references:</u> Triola, M. (2018). Elementary Statistics, 13th Edition. Pearson. Borman, D. (2018). Statistics 101: From Data Analysis and Predictive Modeling to Measuring Distribution and Determining Probability, Your Essential Guide to Statistics. Adams Media Corporation. <u>Additional references:</u> Moore et al. (2018). The Basic Practice of Statistics. W.H.Freeman & Co Ltd Bluman, A. (2017). Elementary Statistics: A Step By Step Approach. McGraw-Hill Education. 											
14.	Other additional information:	None												

1.	Name of course:	Compu	Computer and Cyber Security											
2.	Code of course:	CSS34	23											
3.	Synopsis:	This co cyber s - to inst - to per - to par - to ope	purse provides the students the understanding of computer, software and security such as:- tall and configure systems to secure applications, networks and devices form threat analysis and respond with appropriate mitigation techniques ticipate in risk mitigation activities erate with an awareness of applicable policies, laws and regulations											
4.	Name(s) of academic staff:	Gary Lo	Gary Loh Chee Wyai											
5.	Semester and year of offered	Semes	Semester 1, Year 2											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	Successful completion of CSS3513 Data Communication and Networking											
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											

				Cours Upon	e Leai compl	rning (etion (Dutco of the	nes cour	<u>(CLO</u> se, th	<u>):</u> ie s	tuder	nts s	should be able	e to):	
				CLO1	Rec unp syst tech	cognise atcheo tems nnique	e sec d syst and es to m	curity ems, form inim	vu class ulate nize o	lne sify th r ov	rabili ing t ne so verco	ties he ecur me	, such as potential vuli ity policies the vulnerabi	we nera ar litie	ak config ability in nd counte es (C4, PL	gurations, computer rmeasure O1)
			-	CLO2	Ma: the sect	nipula streng urity (te cor gth of C3, Pl	npute the LO5)	er and netw)	l cy ork	ber s envi	iron	rity technique ment, compu	es a ter	nd tools to systems a	improve nd cyber
			-	CLO3	Exp ope con	olain t rating nputin	he in syste g activ	iport em, vities	ance datab s (C2,	of ase PL	com e, ne 209)	pute two	er and cyber rk and the	seo effo	curity on ects towa	software, rds daily
9.	Mapping of Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	comes	s to	the F	Proç	gram	min	ng Learning	Ou	tcomes, T	eaching
	Course Learning Outcomes	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	7 PLO	58	PLO9	Te	eaching Method	ls	Assess	sment
	CL01	3										Le Pra	cture, Tutorial actical	&	Progress Te Assignment Exam	est, t, Final
	CLO2					3						Le Pra	cture, Tutorial actical	&	Progress Te Assignment Exam	est, t, Final
	CLO3										2	Le As	cture, Tutorial	&	Assignment	t
	Note: 1 = Little Contribution; 2 = Moderate Contribution; 3 = Strong Contribution															
10.	Transferat (if applicat	ole ski ole):	lls	Knowl Lifelor	ledge; ng Lea	Value	es, Atti Skills	tude	s and	Pr	ofess	siona	alism; Informa	atio	n Managei	ment and
11.	Distributio	n of S	stude	nt Lea	rning	Time	(SLT)	:	-		- -					
	Соц	ırse Co	ntent	Outline		CL	0	Guide	ed Lea	rnin	ing (F2	F)	Guided	Ine	dependent	Total
								L	т	F	2	0	Learning (NF2F)	I	Learning (NF2F)	SLT
	 Infrastructure security Introduction to basic security Infrastructure security Intrusion detection and reporting systems Video surveillance systems 						2	2	1						3	6
	2. Local host security - Securing host devices - Inner perimeter protection - Remote access protection						2	2		1	1				3	6
	 3. Local network security Network topologies Networking protocols Network control strategies Network connectivity devices Network transmission media security Network hardening 						,3	2		1	1				3	6
	4. Cyber security - Basic security concepts - Hiding private network - Protecting data moving through the internet - tools and utilities					1,2,	,3	2		1	1				3	6

	- vulnerabilities								
	 5. Enterprise network security Introduction to entreprise networking Security topologies Security zoning models Enterprise server security Corporate cyber security policies 	1,2	2		1			3	6
	6. Enterprise network security (cont.) - network vulnerability scanning concepts - intrusive vs non-intrusive - credentialed vs non-credentialed	1,2	2		1			3	6
	 7. Industrial utility cyber security Industrial control systems Industrial networks Industrial network protocols Utility networks Security policies 	1,2	2		1			3	6
	 8. Healthcare IT security - Healthcare networking - Healthcare data security - Healthcare Information systems - The Internet of Things 	1,2	2		1			3	6
	 9. Introduction to Ethical Hacking The need for ethical hacking Security breach examples The Lockheed-Martin Cyber Kill Chain Penetration testing 	1,2	2		1			3	6
	 10. Introduction to Ethical Hacking (cont.) - social engineering - DDos - Wireless Attack - Cyptographic attacks 	1,2,3	2	1				3	6
	11. Technologies and Tools- firewall- VPN- Proxy	1,2,3	2		1			3	6
	12. Technologies and Tools (cont.) - Access point - Media gateway	1,2,3	2		1			3	6
	 13. Risk Management policies, plans and procedures business impact analysis risk management processes and concepts 	1,2	2	1				3	6
	14. Crytographybasic concepts of crytographycrytography algorithms	1,2	2		1			3	6
	Tot	al (SLT)	28	3	11	-	-	42	84
	Continues Assessment					Percer	ntage (%)		Total
									SLT
	1. Progress Lest						∠U 40		4
							40		ZZ Total
	Final Assessment					Percer	ntage (%)		SLT
	1. Final Examination						40		10
	Tot	al (SLT)				10	00%		36
							GRAN	D TOTAL SLT	1 20
	L = Lecture, T = Tutorial, P = Practical, O = O	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face		
12.	Identify special requirement or resources to deliver the course:Cyber Securi - Marcraft Cyl - Penetration - Kali Linux o - Computers	ty Lab to ber Sec testing perating	o provi urity sy simula syste	de pra ystems itor m	ctical t	ools s	such as:-		

		- Server - Router - Switch - Wifi Access Point
13.	References:	 <u>Main references:</u> Nick Thompson (2016). Cyber Security Essentials: Concepts and Practices Lab Guide. Wiley. ISBN: 9781581221978 Nick Thompson (2016). Cyber Security Essentials: Environments and Testing Lab Guide. Wiley. ISBN: 9781581222371 Emmett A Dulaney (2017). CompTIA security+ study guide. Wiley. ISBN: 9781119416876 Raymond Nutting (2019). CompTIA PenTest+ Certification Bundle (Exam PT0-001). McGraw-Hill US Higher Ed ISE. ISBN: 9781260454185 <u>Additional references:</u> Vacca, J. (2013). Computer and information security handbook. Amsterdam: Morgan Kaufmann Publishers is an imprint of Elsevier.ISBN: 978-0123943972 Maiwald, E. (2013). Network security : a beginner's guide. New York: McGraw-Hill. ISBN: 9780071795708 Gollmann, D. (2011). Computer security. Chichester, West Sussex: Wiley. ISBN: 978-0132775069 Stallings, W. & Brown, L. (2012). Computer security : principles and practice. Boston: Pearson. ISBN: 9780132380331 Stallings, W. (2007). Network security essentials : applications and standards. Upper Saddle River, NJ: Pearson Education. ISBN: 978-0470741153
14.	Other additional information:	None

1.	Name of course:	Human	Computer Interaction											
2.	Code of course:	CSS35	53											
3.	Synopsis:	This co comput design partner prototy	burse provides the students the knowledge about how users interact with ters. Using theories related to "design in the wild", community-based co- and Service-Learning approaches students will engage with community s and translate the results from the formative study into design of a ope or process for the community.											
4.	Name(s) of academic staff:	Tariq Z	aman											
5.	Semester and year of offered	Semest	Semester 1, Year 2											
6.	Credit value:	3	3											
7.	Prerequisite/co- requisite (if any):	None	None											
8.	Learning	Progra	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		Progra Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		Course	e Learning Outcomes (CLO):											

				Upon	compl	etion o	of the	cours	e, th	e stu	dent	s s	hould be able	e to:	
				CLO1	Poir syst	nt out tem (C	what a 2, PL	are th O1)	e ele	emen	ts of	a	good interfac	e design and	a usable
				CLO2	Buil app	d an Iying t	intera he ap	active propr	sys iate t	tem ools	and and	e tec	valuate the chniques (C5	system's us , PLO2)	ability by
				CLO3	Dev com	velop a nmunit	a usat y part	ole sy ner ((stem C6, P	and LO7	pre)	ser	nt the work c	omprehensiv	ely to the
				CLO4	Des	ign th	e prot	otype	with	com	mur	nity	partner and	users (C5, Pl	_08)
9.	Mapping o	f the	Cour	se Lea	arning	Outo	omes	s to t	he P	rogr	amn	nin	g Learning	Outcomes,	Feaching
	Methods a	nd As	Sessi P	nent:	me I ea	rning (Jutcom	es (Pl	0)						
	Learning Outcomes (CLO)	PLO1	PLO2	PL03	PLO4	PLO5	PLO6	PLO7	PLO	98 PL	.09	Те	Teaching Methods Assessment		
	CLO1	3									Lecture, Tutorial			Progress T Final Exam	est, ination
	CLO2		3									Leo	cture, Tutorial	Progress T	est,
	CLO3							3				Practical, Assignment, Computer-based Learning, Service Learning			t, / ht
	CLO4				3 Lecture, Tutorial, Assignment Service Learning Community Assessment						ination t, / nt				
10.	Transferable skills (if applicable): Knowledge; Managerial and Entrepreneurial Skills; Social Skills and Responsibilities														
11.	Distributio	n of S	tuder	nt Leai	rning	Time	(SLT)								
								Cuido	Te	achin	g and	d Le	earning Activiti	es Indonondont	Total
	Cou	irse Co	ntent C	Outline		CLO		L T P 0			0)	Learning (NF2F)	Learning (NF2F)	SLT
	1: Introduct Learning Interaction based Desig HCI history Problems a Recurrent h	tion to Protoc n Projec Ind Cha HCI The	HCI cols for cts llenges emes	and S	Service nunity -	1,2	2	2	1				1	2	6
	2: IntroductLearning (coAn introductParadigm	tion to nt) ction to	HCI 4th wa	and S ave of U	Service Isability	1,2	2	2	1				1	2	6
	 3: Introduction to HCI and Service Learning (cont) Human-Centred Design Participatory Design Interaction Design Community-based Co-Design Design for the Future 							2	1				1	2	6
	4: HCI Design Methodologies • Ethnography and Action Research in HCI •Participatory Action Research in Software Development Methodology Augmentation						2	2		1			1	2	6
	5: HCI Methods STEPS–Software Technology for Evolutionary Participatory Systems Development MUST Method					1,2		2		1				3	6

	Cooperative Experimental System Development (CESD)									
	6: HCI Tools • Sketching • Walkshops • Card sorting • Persona • Scenario • Storyboard • Paper Prototyping • Design Probes • Contextual Inquiry	1,2	2		1			3	6	
	7: Community visit: Requi	rement Analysis	1,2,4	2		1			3	6
	8: Interaction Design Interaction Design and E Interaction Styles 	Design Rules	3,4	2		1			3	6
	 9: Interaction Design (con Choosing Interactive Der and Software Design Standards Designing a Graphical (GUI) Colour Theory 	3,4	2	1				3	6	
	10: Community visit: Co User Interface	3,4	2	1				3	6	
	 11: Design Evaluation Testing in the Wild: Eval Filed Experimental vs. empiric Reasons for Usability an Evaluation 	3,4	2		1			3	6	
	12: Design Evaluation (co • Evaluation through Expe • Cognitive Walkthrough • Heuristic Walkthrough • Nielsen's Ten Heuristics	12: Design Evaluation (cont) • Evaluation through Expert Analysis • Cognitive Walkthrough • Heuristic Walkthrough • Nielson's Ton Houristice				1			3	6
	13: Community visit: Testi and Community Presentation	ng in the Wild tion	2,3,4	2		1			3	6
	14: Advance Topics in HC	;	3,4	2		1			3	6
		Tot	al (SLT)	28	5	9		4	38	84
	Continues /	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							10		4
	2. Assignments							30		20
	3. Presentation							10		2
	Final Ass	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination							50		10
		Tot	al (SLT)				1	00%		36
		. ,					GRAN	D TOTAL SLT	120	
	L = Lecture, T = Tutorial, P	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face			
12.	Identify special requirement or resources to deliver the course:									
13.	. References: • Filimowicz, M., & Human-Computer Publishing.				kova, V action:	/. (Eds Volum	.). (20 ne 1-T)18). New Dir echnologies.	ections in Thi Springer Inte	rd Wave rnational

		 Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann.
		 <u>Additional references:</u> Winschiers-Theophilus, H., Zaman, T., & Stanley, C. (2019). A classification of cultural engagements in community technology design: introducing a
		 transcultural approach. Ai & Society, 1-17. Zaman, T., Winschiers-Theophilus, H., George, F., Wee, A. Y., Falak, H., & Goagoses, N. (2016, August). Using sketches to communicate interaction protocols of an indigenous community. In Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops-Volume 2 (pp. 13-16).
		• Reitsma, L., Light, A., Zaman, T., & Rodgers, P. (2019). A Respectful Design Framework. Incorporating indigenous knowledge in the design process. <i>The Design Journal</i> , <i>22</i> (sup1), 1555-1570.
		• Goh, C. H., Kulathuramaiyer, N., & Zaman, T. (2017, May). Riding waves of change: a review of personas research landscape based on the three waves of HCI. In <i>International Conference on Social Implications of Computers in Developing Countries</i> (pp. 605-616). Springer, Cham.
14.	Other additional information:	None

1.	Name of course:	Artificia	I Intelligence									
2.	Code of course:	CSS35	63									
3.	Synopsis:	This co knowle Langua	burse provides the students the knowledge of Artificial Intelligence (AI), dge representation, and application of AI such as Neural Network, Natural ge Processing, Genetic Algorithm, and Swarm Intelligence.									
4.	Name(s) of academic staff:	Chang	Wui Lee									
5.	Semester and year of offered	Semes	ter 1, Year 2									
6.	Credit value:	3	3									
7.	Prerequisite/co- requisite (if any):	Succes	Successful completion of CSS3123 Data Structure and Algorithms									
8.	Learning	Program	mme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		Program Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8 Communicate effectively with the computing development community at with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.									
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									

				CLO1	App (C3	oly the , PLO	theor 1)	etica	al conc	ept o	f Aı	rtific	cial Intelligence	ce for a given	problem.
				CLO2	Eva rea	aluate I-world	the a I prob	oplic Iem.	ation ((C5, F	of an PLO4	Art)	tifici	al Intelligenc	e method in	solving a
				CLO3	App dev	oly skil elopm	ls and ient. (prin C3,	iciples PLO9)	of life	elon	ng le	earning in bot	h academic a	nd career
9.	Mapping o Methods a	of the nd As	Coui	rse Lea ment:	arning) Outo	comes	s to	the P	rogra	amr	min	g Learning	Outcomes, 1	eaching
	Course		I	Program	me Lea	arning (Dutcom	nes (F	PLO)						
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLC	07 PLO	8 PL	09	Те	aching Method	s Assess	sment
	CLO 1	3										Leo	cture, Tutorial	Progress To Final Exam	est, ination
	CLO 2				3							Ass	signment	Final Exam	ination
	CLO 3									3	3	Ass	signment	Assignmen	t
	Note: $1 = Lit$	oderate	Contrib	oution; 3	B = St	trong Co	ntribut	tion							
10.	Transferable skills (if applicable):Knowledge Lifelong Le					Probl	em so Skills	olvin	g and	scier	ntifi	c s	kills; Informa	tion Manager	ment and
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:							
									Te	eachin	g ar	nd L	earning Activiti	es	
	Course Content Outline					CLC	> _	Guid	led Lea	rning ((F2F	-)	Guided	Independent	Total SI T
						L	L	т	Р		0	(NF2F)	(NF2F)	361	
	1. Overview	of Artifi	cial Int	elliaence									,	· · /	
	 Definition 	n of Al		J		1		2						1	2
	 Basics o 	f Al				I		2						I	3
	The History of AI														
	2. Represen	tation a	nd Sea	arch											
	The Pred Structure Space S	dicate C es and earch	alculu Strate	s gies for	State	1		2	1					2	5
	3. RepresenHeuristicStochast	tation a : Search tic Meth	nd Sea n ods	arch- con	t.	1		2	1					2	5
	4. Represen • Building Space S	tation a Control earch	nd Sea Algori	arch- con ithms for	t. State	1		2	1					2	5
	5. RepresenKnowled	tation a lge Rep	nd Inte resent	elligence ation		1		2	1					2	5
	 Represen Strong M 	tation a lethod l	nd Inte Problei	elligence- m Solving	cont.	1		2	1					2	5
	7. Represen• Reasoni	tation a ng in Ur	nd Inte ncertai	elligence- n Situatio	cont. ons	1		2	1					2	5
	 8. Machine I Symbol- 	₋earninថ Based	9			1,2,3	3	2	1					2	5
	9. Machine Learning- cont.Connectionist				1,2,3	3	2	1					2	5	
	10. Machine • Social ar	Learnir nd Eme	ng- cor rgent2	nt.		1,2,3	3	2	1					2	5
	 11. Intelligent System Applications Supervised and unsupervised learning 			rvised	2,3		2	1					2	5	
	12. Intelligent System Applications- cont.				cont.	2,3		2	2					3	7

	Natural Language Pro	ocessing										
	13. Intelligent System AppGenetic Algorithm	olications- cont.	2,3	2	2				3	7		
	14. Intelligent System AppParticle Swarm Intellig	olications- cont. gence	2,3	2	2				3	7		
	-	otal (SLT)	28	16	-	-	-	30	74			
				1						_		
	Continues	Assessment				I	Percer	ntage (%)		Total SLT		
	1. Progress Test							20		10		
	2. Assignment and Prese	ntation						30		20		
	Final As				I	Percer	ntage (%)		SLT			
	1. Final Examination						50		16			
	Total (SLT						1	00%		46		
	L Lastura T. Tutarial D	Others F2F	. <u> </u>	to Food		Non	GRAN	ID TOTAL SLT	120			
		= Flactical, O =	Others, FZF	= race	IU Face	, NFZF :		Face lo Face				
12.	requirement or resources to deliver the course:	ement or ces to the course:										
13.	References:	Main referent	<u>nces supp</u> X. Govers	<u>porting the course:</u> s. (2018) Artificial Intelligence for Robotic: Build intelligence								
		Robots Limited.	that perfo Print. ISB	orms H SN: 978	luman 3-1788	Tasks 83544	usin 2	g Al Technic	ues. Packt P	ublishing		
		 Aurélien and Te 	Géron. (2 nsorFlow:	2019) I Cono	Hands-	-On Ma Tools	achin . and	e Learning w d Technique	ith Scikit-Lear	n, Keras, ntelligent		
		Systems. O'Reilly Media. Print. ISBN: 9781492032649										
		Additional re	eferences	suppo	orting t	he cou	rse:					
		Aggarwal, C. C. (2018). Machine Learning for Text. Springer. ISBN No.: 9783319735306										
	 Natalia, S. (2017). Pervasive Computing: Engineering Smart Systems. Springer, JSBN No.: 9783319516547 							S.				
		 Sandro, 9783319 	S. (2018) 9730035	Introd	luction	to Dee	ep Le	arning. Sprin	ger. ISBN No.	:		
14.	Other additional information: None											

1.	Name of course:	Ethics a	and Professionalism									
2.	Code of course:	CSS36	13									
3.	Synopsis:	To prov the wor are able	vide the students the understanding of responsibilities and ethical issues in king environment, risks and liabilities, and intellectual property so that they a to develop the software without violating legality.									
4.	Name(s) of academic staff:	Tariq Z	aman									
5.	Semester and year of offered	Semes	ter 1, Year 2									
6.	Credit value:	3										
7.	Prerequisite/co- requisite (if any):	None	None									
8.	Learning	Program	mme Educational Objectives (PEO):									
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and									
		PLO2	Apply theoretical principles of computer science in relevant areas, and									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and									
		PLO8	PLO8 Communicate effectively with the computing development community and with the society at large, and									
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.									
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									

				CLO1	Ana ass	ilyse ii ociate	mpact d with	of te them	chno n. (C∠	logy d 1, PLC	on e D 9)	evei)	ryday life and	l ethio	cal issue	s 1
				CLO2	Ider life	ntify et situati	thical on. (C	and p 2, PL	orofes .O 5)	ssiona	al v	alu	es when give	en ca	st study	on real 2
				CLO3	Der beh	nonstr aviou	rate th r. (C3,	e uno PLO	lerlyi 6)	ng co	nce	epts	of both tech	nolog	gy and et	hical
9.	Mapping of Methods a	of the	Cour	se Lea	arning	Outo	comes	s to t	he P	rogra	amr	min	g Learning	Outc	comes, T	eaching
	Course		<u>3033</u> F	Program	me I ea	rning (Dutcom	es (Pl	0)							
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLC	98 PL	09	Т	eaching Metho	ds	Asses	sment
	CLO1									3	3	Leo Ble	cture, Tuto ended Learning	rial,	Progress Final Exar	Test, nination
	CLO2					3						Leo Ca	cture, Tuto se study	rial,	Progress Final Exar	Test, nination
	CLO3						3					Pra Co Lea	actical,Assignme mputer-based arning	ent,	Assignme	nt
10.	Transferable skills (if applicable):Information Professiona						gemer Comm	nt and unica	l Life tion,	long l Lead	_ea ers	rnir hip	ng Skills; Valu and Team S	ue, A kills	ttitudes a	and
11.	Distributio	on of S	tude	nt Lea	rning	Time	(SLT)	:								
									Te	eachin	g ar	nd L	earning Activiti	es		Tatal
	Cou	Course Content Outline					o _ '	Guided Learnin		rning (F2F	Learning		Inde	ependent	l otal SLT
					L	т	Ρ	(0	(NF2F)	1)	NF2F)	_			
	 Professional Ethics for Computer Science Motivation and basics Reflection Exercise Is "wrong" the opposite of "right"? Case study: a conflicting scenario. 					1,2	,3	2	2						2	6
	2. Philosop Ethics Ethic Theories • Ethics, F • The Nor • Nuremb • Human	hical Ba cal Con Respons mative F erg Cod Rights re	ases fo cepts sibility a ramev e (194 egime	or comp and Ethi and Refle work 8)	uter ical exivity	1,2	,3	2	2						2	6
	3. Profession • Digital lo • Censors • The Poli • Case stu	bnal Residentity hip tics of A udy	spons	ibility ms		1,2	,3	2	2						2	6
	 4. Code of Ethics ACM, IEEE and Malaysian National Computer Confederation Code of Ethics for Community Informatics Researchers Minimum Ethical Standards for ICTD/ICT4D research Malaysian National Computer Confederation Code of Ethics 				1,2	,3	2	2						2	6	
	5. Principles and Norms of Ethics Acknowledgement and contribution to the society: case study					1,2	,3	2	2						2	6
	 6. Principles and Norms of Ethics(cont) Respect Privacy, Confidentiality, and Anonymity Case study 					1,2	,3	2	2						2	6
	 7. Principles and Norms of Ethics(cont) Avoid harm Case study 				1,2	,3	2	2						2	6	
	8. Principles and Norms of Ethics(cont)					1,2	,3	2	2						2	6

	 Be honest and trustwo 	orthy Case study										
	 9. Principles and Norms Racial Discrimination Case study: Case study Whitesave.me 	o f Ethics(cont) in Digital Age dy:	1,2,3	2	2				2	6		
	 10. Data Ownership and Data Security, manag Ownership Case stud 	Governance ement and y	1,2,3	2	2				2	6		
	11. Data Ownership and Governance(cont)Treatment of Data Ca	se study	1,2,3	2	2				2	6		
	 12. Ethics and Behavior Moral Psychology and Ii Ethical Issues in dealing Property Copyright Industrial Property Trademarks Patent Industrial designs Trade secrets Geographical Indication 	1,2,3	2	2				2	6			
	13. Professionalism: Dealing with Risks Case s	1,2,3	2	2				2	6			
	 14. Professionalism (co • Contemporary Issues • Seminar on Disinform Intelligence, Crowdso Computing 	1,2,3	2	2				2	6			
		tal (SLT)	28	28				28	84			
	Continues	Assessment					Perce	ntage (%)		Total SLT		
	1. Progress Test			10 4								
	2. Assignment			30								
	3. Presentation							20		2		
	Final As	sessment			Total SLT							
	1. Final Examination				10							
		Tot	al (SLT)				1	00%		36		
	L = Lecture T = Tutorial P	- Practical O - O	thers F2F	– Face	to Face	NF2F	– Non	GRAN Face to Face	ID TOTAL SLT	120		
12.	Identify special requirement or resources to deliver the course:	= Practical, O = Others, F2F = Face to Face, NF2F = Non Face to Face None										
13.	References:	 <u>Main references:</u> Winston, M. & Edelbach, R. (2014). Society, ethics, and technology. Boston, MA: Wadsworth Cengage Learning. Tavani, H. (2013). Ethics and technology : controversies, questions, and strategies for ethical computing. Hoboken, NJ: Wiley. Poel, I. & Royakkers. (2011). Ethics, Technology, and Engineering: An Introduction. Malden, Mass: Wiley-Blackwell. ISBN-13: 978-1444330953. Quinn, M. (2015). Ethics for the information age (6th Ed.). Boston: Pearson. ISBN-13: 978-0133741629. 										
		• Quinn, M. ISBN-13:	. (2015). 978- 01	Ethic 33741	s for tl 629.	he info	ormati	on age (6th I	Ed.). Boston:	Pearson.		

1.	Name of course:	Digital	Innovation and Entrepreneurship										
2.	Code of course:	CSS36	32										
3.	Synopsis:	Innovat product disciplir expose succes	tion and entrepreneurial skills are required to commercialize new digital ts and services, and bring new ventures to the market. Using a set of ned entrepreneurship frameworks and lean startup concept, students are d to the essential process steps on how to transform potential ideas to sful business ventures, whether for commercial or social development.										
4.	Name(s) of academic staff:	Jackie	Ting Tiew Wei										
5.	Semester and year of offered	Semes	ter 1, Year 2										
6.	Credit value:	2	2										
7.	Prerequisite/co- requisite (if any):	Successful completion of CSS3622 Design Thinking and Presentation											
8.	Learning	Program	mme Educational Objectives (PEO):										
	outcomes:	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Prograr</u> Upon c	mme Learning Outcomes (PLO): ompletion of the program, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.										
		Course	Learning Outcomes (CLO):										

			Upon	Upon completion of the course, the students should be able to:										
			CLO1	Und cust	ersta omer	nd the s, mar	e imp kets	ortance and ec	ce and conomi	l impa ies (Pl	act of digit LO9, C2)	al innovation	towards	
			CLO2	App brin	ly dis g inno	cipline ovatior	d ent	repren a mark	eurshi ket (PL	p fram O7, C	nework in cr 3)	eating new ve	ntures to	
			CLO3	Dev vent	velop business plan and execution strategies as a team to launch new ntures and products in the market (PLO6, C6)									
9.	Mapping of the Methods and	he Cou Assess	rse Lea sment:	arning	Outo	comes	s to t	he Pro	ogram	ming	Learning	Outcomes, T	eaching	
	Course Learning Outcomes PL (CLO)	.01 PL02	Program PLO3	me Lea PLO4	PLO5	PLO6	PLO7	- O) PL08	PLO9	Tead	ching Method	s Assessi	ment	
	CLO1								2	Lectu Pract	ire, Tutoria ical	al, Quiz, Ass Final Examir	signment, nation	
	CLO2						3			Lectu Pract	ire, Tutoria tical	al, Quiz, Ass Project, Pres	signment, sentation	
	CLO3 3							Lectu Pract	ire, Tutoria ical	al, Quiz, Ass Project, Pres	signment, sentation			
10.	Transferable skills (if applicable):Information Entrepreneu					agem kills; C	ent comm	and I unicat	_ifelon ion, Le	g Le eaders	arning Sk ship and Te	ills; Managei am Skills	rial and	
11.	11. Distribution of Student Learning Time (SLT):												1	
	Course Content Outline					Guided			aching rning (F	and Le 2F)	arning Activi Guided	ties Independent	Total	
	oouise	e oomen	outime				L	т	Р	0	Learning (NF2F)	Learning (NF2F)	SLT	
	1. Innovation and Entrepreneurship: A Overview													
	Relationship Entrepreneu Business Ve Ventures, S New Venture	o betweer irship entures, ∃ Social Ver es.	n Innova Technolog ntures, C	tion and gy-based corporate	1 1 1	, 3	1	1				2	4	
	 2. Digital Entrept Market Pull Disciplined E 	reneurial vs. Techn Entreprene	Process 2 ology Pus eurship co	l sh oncept	1	, 2	1	1				2	4	
	3. Digital Entrepo24 Steps to aEntrepreneu	reneurial a success irship as a	Process 2 ful ventui team sp	2 re ort	1	, 2	1	1				2	4	
	 4. Understanding Market segmination Identify Beach 	g Custom nentation chhead m	ers and M arket	larkets	1	, 2	1		1		1	1	4	
	 5. Understanding Building a us Estimate add 	g Custom ser persor dressable	ers and M na market	larkets 2	2	, 2	1		1		1	1	4	
	 6. Develop Value Propositions 1 Problem statements Buyer Experience cycle Value Proposition canvass 					, 3	1		1		1	1	4	
	 7. Develop Value Propositions 2 Develop full lifecycle use case Competitive analysis 					, 3	1		1		1	1	4	
	 8. Customer Acquisition Process Map the Process to Acquire Customers Map the Sales Process to Acquire Paying Customers 				2	, 3	1		1		1	1	4	
	9. Developing ButBusiness MotionPricing Frame	9. Developing Business Model 1 • Business Model Canvass • Pricing Framework				, 3	1		1		1	1	4	

r												
	10. Developing BusinessLifetime Value (LTV)Cost of Customer Acq	Model 2 juisition (COCA)	2, 3	1		1		1	1	4		
	11. New Product DevelopMinimum Viable ProductProduct development	2, 3	1		1		1	1	4			
	 12. Financing New Ventur Funding Sources: Angel & Venture Capi Exit Options & Strateg 	3	1	1				2	4			
	 13. Intellectual Property Partnership Types of IP: Pa Trademark Technology Licensin Partnership Models 	3	1	1				2	4			
	 14. Case Study Digital Ventures Social Entrepreneursh Successful Tech Unic 	1, 2, 3	1	1				2	4			
		tal (SLT)	14	6	8		8	20	56			
									Total			
	Continuous					Percent	age (%)		SLT			
	1. Quiz		10 1									
	2. Assignment			10								
	3. Project		20									
	Final As	sessment		Percentage (%)								
	5. Final Exam		40									
		Т	Total SLT 100%									
		Brastiaal O Oth	GRAND TOTAL SLT 80									
12.	Identify special requirement or resources to deliver the course:	Must conduct	Maker/H	lackat	hon ev	vent an	d TED	-style prese	entation.			
13.	References:	 <u>Main references:</u> Aulet, B. (2018). Disciplined Entrepreneurship. O'Reilly Media. ISBN-13: 978-1118692288 Blank, S. (2020). The Startup Owner's Manual. Wiley. ISBN-13: 978-1119690689 <u>Additional references:</u> Osterwalder, A. (2017). Business Model Generation. Weiser. ISBN-13: 978-0470876411 										
14.	Other additional	None										

`1.	Name of course:	Web te	Veb technology															
2.	Code of course:	CSS33	33															
3.	Synopsis:	This co develop and to s	urse provides the students with advanced knowledge of web based system oment process, so that the students are able to develop web-based system solve the problem of an organization.															
4.	Name(s) of academic staff:	Anli Sh	erine															
5.	Semester and year of offered	Semes	ter 2, year 2															
6.	Credit value:	3																
7.	Prerequisite/co- requisite (if any):	Succes Databa	Successful completion of CSS3133 Object Oriented Programming , CSS3323 Database Development and Applications															
8.	Learning	Program	mme Educational Objectives (PEO):															
	outcomes:	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.																
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.															
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.															
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:															
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and															
		PLO2	Apply theoretical principles of computer science in relevant areas, and															
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and															
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and															
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and															
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and															
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and															
		PLO8	Communicate effectively with the computing development community and with the society at large, and															
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.															
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:															
				CLO1	Explain different components and technologies of World Wide Web as a platform (PLO1, C2)													
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				CLO2	App app	ly jav licatio	va ar ns. (P	id se LO3,	rver C3)	side	scri	ipting langua	ges to deve	elop web				
				CLO3	Dev tool	velop \ s. (PL	Nebsi O4, C	tes us 5)	ing fu	Indam	enta	al Web langua	ges, technolo	ogies and				
9.	Mapping o	of the	Cou	rse Lea	arning	Outo	omes	to th	ne Pr	ogran	nmi	ng Learning	Outcomes, 1	Feaching				
	Course		3033	Program	me Lea	rnina (Dutcom	es (PL	0)									
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO8	PLO9	Ţ	Feaching Method	s Assess	sment				
	CLO1	3									Le	ecture, Practical	Progress T Assignmen Final Exam	est, t ination				
	CLO2			3							Le	ecture, Practical	Progress T Assignmen Final Exam	est, t, ination				
	CLO3				3						P	ractical	Assignmen	t				
	Note: $1 = Lit$	tle Cont	tributic	on; $2 = Mo$	oderate	Contrib	oution; 3	s = Strop	ng Cor	tributio	n							
10.	Transferat (if applicat	edge;	practi	cal sk	ills; Pr	oblen	n solv	ing a	and scientific s	skills.								
11.	1. Distribution of Student Learning Time (SLT):																	
	Teaching and Learning Activities																	
	Course Content Outline CLO Guided Learning (F2F) Guided Independent											CLO Guided Learning (F2F) Guided In						
								L T P O Learning Learning SL										
	1. Introduction	on to Int	ternet	and Wor	d Wide							(()					
	Web • Internet F • Who mar • Web Star • Web Prog Languag side Lan	 Introduction to Internet and World Wide Web Internet History and technologies Internet Protocols Who manages the Internet? Web Standards Web Programming Languages: Markup Languages, Client-side and Server- cide Languages 					2	2					2	4				
	2. Hypertext • Definition • The Cond • SGML • Introducti • XHTML	Markup is of WV cept of M	o Lang VW, H Marku TML	uage(HT ITTP and p Langua	ML) ⊢HTML ge	1,2,	3	2		1			3	6				
	3. Cascading Style Sheet (CSS) Introduction to CSS W3 validation service CSS syntax Selectors Style Sheet Precedence CSS Positioning Creating layers through style sheets CSS3				1,2,	3	2		1			3	6					
	 4. Introduction Overview JavaScrip JavaScrip Flow 	on to Ja of Java ot Basic pt Expr	avaScrip aScrip s essior	ript t ns and	Control	1,2,	3	2		1			3	6				
	Flow 5. Introduction to JavaScript-Cont. • JavaScript Functions • JavaScript Objects • JavaScript Arrays					1,2,	3	2		1			3	6				
	6. Introduction	on to Ja	vaScr	ipt-Cont.		1,2,	3	2		2			4	8				

	l											
	 Prototype based Programming Exception Handling 	Object-Oriented										
	7. JavaScript with Docume (DOM) • The Document Tree • DOM Document Objec • DOM Events	ent Object Model	1,2,3	2		1			3	6		
	8. JavaScript with Docume (DOM) – cont. • Working with Browser • Windows, Document, Objects. • Properties and Method	ent Object Model Objects History, Location ds.	1,2,3	2		2			4	8		
	9. JavaScript with Docum (DOM) – cont. • JSON •j Query	ent Object Model	1,2,3	2		1			3	6		
	 10. XML Versions and Declarat Namespaces: JavaSci 	ions ript and XML	1,2,3	2		1			3	6		
	11. XML– cont. • DOM based XML Proc • Selecting XML data • Displaying XML docum	1,2,3	2		1			3	6			
	12. PHP language • Introduction to PHP • PHP Syntax and Data • PHP Control Structure • PHP Arrays	1,2,3	2		1			3	6			
	13. PHP language -cont • PHP Functions • PHP Objects • PHP Sessions • PHP Cookies	1,2,3	2		2			3	7			
	 14. PHP language and Ot Perl, Python and Ruby Scripting Language 	her Languages y as Server-Side	1,2,3	2		2			3	7		
		Tot	tal (SLT)	28	-	17	-	-	43	88		
	Continues	Assessment			Percentage (%)							
	1. Progress Test				4							
	2. Assignment							40		18 Total		
	Final Ass	sessment					Percer	ntage (%)		SLT		
	1. Final Examination	Ta						40		10		
		101		L			10	GRAN		32 120		
	L = Lecture, T = Tutorial, P	= Practical, O = O	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face		120		
12.	Identify special requirement or resources to deliver the course:	PHP, PC with	n Webse	erver s	oftwar	e insta	lled.					
13.	 References: Nixon, R. (2018). Learning PHP, MySQL, JavaScript and CSS: A Step-by-Step Guide to create Dynamic Websites. O'Reilly Media. ISBN: 9781491978917 Benfrain (2020). Responsive Web Design with HTML5 and CSS3. Packt Publishing Ltd. ISBN: 9781784398934 Additional references: 											

		 Jennifer Robbins (2018). Learning Web Design. O'Reilly Media ISBN: 9781491960202 MacDonald, M.(2014). HTML5: The Missing Manuel. O'Reilly Media. ISBN-13: 978-1449363260
14.	Other additional information:	None

1.	Name of course:	Algorith	rithm and Design Complexity 3143											
2.	Code of course:	CSS31	S3143 s course provides the students the knowledge of the time and space complexity											
3.	Synopsis:	This co of com comple solve th	urse provides the students the knowledge of the time and space complexity puter algorithms and the important part of a broader computational xity theory such as sorting, searching, and graph algorithms in order to be problems with different paradigms.											
4.	Name(s) of academic staff:	Jackie	Ting Tiew Wei											
5.	Semester and year of offered	Semest	mester 2, Year 2											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):													
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	PEO3 Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Prograr</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the software system development community and with the society at large											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development											
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	App proę	ly the grams	basic for gi	prob ven p	lem-s roble	olving ms (C	tec 3, P	chniques to dev PLO4)	elop algorithr	ns and	
			-	CLO2	Cor con	nstruct struct	comp flow c	lete p harts	orogra for co	ams ba omput	ase er c	d on a given sp code (C6, PLO2	pecification ar 2)	nd	
				CLO3	Dev able	elopir to pr	ng con esent	nplete solut	e prog ion cle	ram a early a	nd g and	give appropriat confidently (C6	e justification 8, PLO1)	and	
9.	Mapping o Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	omes	to t	he Pr	ograr	nm	ing Learning	Outcomes, 1	Feaching	
	Course		F	Program	me Lea	Learning Outcomes (PLO)									
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	B PLOS		Teaching Method	ls Assess	Assessment	
	CLO1		3								L	Lecture, Tutorial	Final Exam	est, ination	
	CLO2			3							L F t	Lecture, Tutori Practical, Compute based Learning	al, er- Progress T	t, est	
	CLO3				3	Practical, Computer- based Learning Presentation									
	Note: 1 = Lit	tle Con	tributio	n; 2 = Ma	oderate	Contrib	ution; 3	= Stro	ong Co	ntributic	on	0			
10.	Transferat (if applicat	ole ski ole):	lls	Knowl	edge;	Practi	cal Sk	ills; A	Assigr	iment;	Pro	ogress Test; Fi	nal Examinat	ion	
11.	Distributio	n of S	tude	nt Leai	rning	Time	(SLT)		Ta	b :					
								Cuida		aching	and		es Independent	Total	
	C οι	Course Content Outline							T	P	2F) 0	Learning (NF2F)	Learning (NF2F)	SLT	
	1. Introduction to Design and Analysis of Algorithm - Time and Space Complexity - Random Access Machine Model of Computation Algorithmic Paradigms Problem Classes				1,2	2	2					2	4		
	2. Mathem - Gr - Bir - Bir - Pr - St	natical rowth R unctions g O-Not operties umming	Tools ates of ation s of Lo Seque	Sample garithms ences		1,2	2	2					2	4	
	Summing Sequences Summing Sequences Summing Sequences Binomial Coefficients Factorials Harmonic Numbers Generation Functions					1,2,	3	2	2				4	8	
	A. Recurrence Equations					1,2,	3	2					2	4	
	S. Divide and Conquer Algorithms Sinary Search Max-Min Problem Fast Integer Multiplication				ms า	1,2,	3	2	2				4	8	
	6. Divide a - St - Co Re	and Col rassen's ommon ecurrence	n quer s Matri Gene ce Equ	Algorith x Multipli eral For ations	ms cation m for	1,2,	3	2					1	3	

-														
	7. Advanced Sorting A - Quick Sort - Heapsort - Shellsort	lgorithms	1,2,3	2		2			3	7				
	8. Advanced Sorting A - Counting Sort - Radix Sort - Bin Sort	lgorithms	1,2,3	2	2	2			2	8				
	9. Searching Algorithn - Sequential Sea - Aho-Corasick A - Knuth-Morris-Pi	n s rching Igorithm rat Algorithm	1,2,3	2	2	2			1	7				
	10. Searching Algorith - Rabin-Karp Algo - Boyer-Moore Al - Hash Tables	1,2,3	2		2			2	6					
	11. Graph Algorithms - Depth-First ar Search - Kruskal's and P - Dijkstra's Algori	1,2,3	2		2			3	7					
	12. Graph Algorithms - Eular Circuits - Hamiltonian Circ	uits	1,2,3	2		2			3	7				
	13. Problem Classes - Polynomial Tim - Non-Determinis Time Problems	1,2,3	2					1	3					
	14. Problem Classes - NP-Complete P - Decidable/Unde Problems	roblems ecidable	1,2,3	2					0	2				
		Tot	al (SLT)	28	8	12			30	78				
			. ,											
	Continues	Assessment					Percer	ntage (%)		Total SLT				
	1. Progress Test				4									
	2. Group Assignment				18									
	3. Individual Assignment -	 Presentation 						20		10				
	Final As	sessment					Percer	Total SLT						
	1. Final Examination				10									
		Tot	al (SLT)				1	00%		42				
	L – Locturo, T – Tutorial, D	- Prostical O - O	thora E2E	- Foor	to Foo		- Non	GRAN	ID TOTAL SLT	120				
			111013, 1 21	- 1 ace		5, INI 21	- 11011							
12.	Identify special requirement or resources to	none												
13.	References:	Main reference Anam Fair Distributo Sedgewice Algorithm Skiena, S 03879486 Additional ref Benoit, A Paradigm	<u>ces:</u> ruqi . 20 rs Pvt Li k, R. & s. Addis S.S. 201 S07 <u>erences</u> a, Robe s, Metho	<u>SS:</u> Jqi . 2016. Design and Analysis Of Algorithms. CBS Publishers & s Pvt Ltd, India. ISBN-13: 978-9385915048 c, R. & Flajolet, P. 2013. An Introduction to the Analysis o . Addison-Wesley. ISBN-13: 078-5342400090 S. 2010. The Algorithm Design Manual. Springer. ISBN-13: 978 07 <u>erences:</u> , Robert, Y. & Vivien, F. 2013. A Guide to Algorithm Design										
		Algorithm	s and D	ind Data Structures series). CRC Press. ISBN 9781439825648										

		Cormen T.H., Leiserson, C.E., Rivest, R.L., & Stein, C. 2009. Introduction to Algorithms. The MIT Press. ISBN-13: 978-0262033848
14.	Other additional information:	None

1.	Name of course:	Softwa	re Quality and Testing
2.	Code of course:	CSS34	43
3.	Synopsis:	This co student the soft	burse provides the knowledge of software quality and testing so that the is understand how to implement software testing, fix the bugs, and improve tware performance.
4.	Name(s) of academic staff:	Chew P	Kim Mey
5.	Semester and year of offered	Semes	ter 2, Year 2
6.	Credit value:	3	
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3413 Introduction of Software Engineering
8.	Learning	Program	mme Educational Objectives (PEO):
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.
		Program Upon c	<u>nme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and
		PLO2	Apply theoretical principles of computer science in relevant areas, and
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and
		PLO8	Communicate effectively with the computing development community and with the society at large, and
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:

				CLO1	Rec test	ogniz ing (C	e the 2, PL0	softw D1)	are te	sting	pro	ces	ss and the i	mportance of	software
			-	CLO2	App (C3	lying , PLO	softwa 3)	are tes	sting k	nowle	edg	e ir	n software d	evelopment li	fe cycle
				CLO3	Des	ign te	st cas	e in tl	ne doo	cumer	ntat	ion	(C6, PLO4)		
9.	Mapping o	of the	Cour	se Lea	arning	Outo	comes	s to t	he Pr	ogran	nm	ing	g Learning	Outcomes, 1	Feaching
	Methods a	nd As	Sess F	ment: Program	me Lea	rnina (Dutcom	es (Pl	0)						
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9		Теа	aching Method	s Assess	sment
	CLO1	3									L	_ect	ture, Tutorial,	Assignmen Progress T Final Exam	t, est, ination
	CLO2			3							L F t	Lect Prac	ture, Tutoris ctical, Compute ed Learning	al, Assignmen er- Progress T Final Exam	t, est, ination
	CLO3				3						L F L	Lect Prac	ture, Tutoria ctical, Compute ed Learning	al, er- Assignmen	t
	Note: 1 = Lit	ttle Con	tributio	n; 2 = Me	oderate	Contrik	oution; 3	B = Stro	ng Cor	ntributio	n				
10.	Transferat (if applicat	ole ski ble):	edge;	Pract	ical Sk	kills; F	roble	m Sol	vinę	g a	nd Scientific	Skills			
11.	Distributio	on of S	Stude	nt Lea	rning	Time	(SLT)	:							
								Cuida	Tea	iching	and	Lea	arning Activiti	es Indonondont	Total
	Coι		CL	0	L	T	P	2F) 0		Learning (NF2F)	Learning (NF2F)	SLT			
	1. Fundame Importar Seven T Fundam Psycholo Code of	 Fundamentals of Testing Importance of Testing Seven Testing Principles Fundamental Test Process Psychology of Testing 						2						2	4
	2. Testing Cycle • Software • Test Lev • Maintena • Test Typ	Through e Develo vels ance Te pes	pout the opment esting	e Softwa Models	are Life	1,2	2	2	2					4	8
	3. Static TecStatic Tec	chniques echnique	s es & th	e Test P	rocess	1,2	2	2						2	4
	4. Static Tec • Review	chniques Process	6 6			1,2	2	2						2	4
	5. Static Tec • Static Ar	hniques halysis	s - cont	t.		1,2	2	2	2					4	8
	6. Test Desi • Test Dev	gn Tech velopme	niques ent Pro	s cess		1,2	,3	2						2	4
	 7. Test Desi Categori 	7. Test Design Techniques -cont.Categories of Test Design Techniques					,3	2						2	4
	 8. Test Design Techniques -cont. Specification-based or Black-box Techniques Structure-based or Whitebox Techniques 					1,2	,3	2		2				4	8
	9. Test DesiExperierChoosin	Techniques 9. Test Design Techniques - cont. • Experience-based Techniques • Choosing Test Techniques				1,2	,3	2		2				4	8
	10. Test Ma	10. Test Management					,3 3	2		2				4	8

	 Test Organization Test Planning and Est 	timation												
	11. Test Management - co • Test Progress Monito • Configuration Manage	ont. ring and Control ement	1,2,3	2		2			4	8				
	12. Test Management - ceRisk and TestingBugs and Incident Ma	ont. Inagement	1,2,3	2		2			4	8				
	 13. Tools Support for Tes Types of Test Tools Effective Use of Tools Benefits and Risks 	ting s, Potential	1,2,3	2		2			4	8				
	14. Tools Support for TesIntroducing a Tool into	ting -cont. an Organization 1,2,3		2					2	4				
		Tot	al (SLT)	28	4	12		44	88					
	Continues	Assessment			Total SLT									
	1. Progress Test				4									
	2. Assignment				40									
	Final As					Percer	ntage (%)		Total SLT					
	1. Final Examination							40		10				
		Tot	al (SLT)				1	00%		32				
	L = Lecture. T = Tutorial. P	= Practical. O = O	thers. F2F	= Face	e to Fac	e. NF2F	= Non	Face to Face	ID TOTAL SLT	120				
12.	Identify special requirement or resources to deliver the course:	SourceMonito	or/Any s	oftwar	e qual	ity test	ing to	ols						
13.	deliver the course: 3. References: • Dorothy Graham, Rex Black, Erik Van Veenendaal. (2019). Foundations of software testing: ISTQB certification 4th edition. Cengage. ISBN: 978-1473764798. • William E. Lewis. (2017). Software Testing and Continuous Quality Improvement (3rd Edition). Auerbach Publications. ISBN: 978-1351722209. Additional references: • Gerard O'Regan. (2019). Concise Guide to Software Testing. Springer. ISBN: 978-3030284930. • J. J. Shen. (2019). Software Testing: Techniques, Principles, and Practices. Independently Published. ISBN: 978-1693054907													
14.	Other additional	None												

1.	Name of course:	Require	ement Engineering											
2.	Code of course:	CSS34	S3433											
3.	Synopsis:	This co Importa with rec	urse provides the students the knowledge of requirement engineering, its ance in software development life cycle, different methods and tools to deal quirement elicitation and representation.											
4.	Name(s) of academic staff:	Daniel	Tan Yong Wen											
5.	Semester and year of offered	Semes	ter 2, Year 2											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3413 Introduction to Software Engineering											
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											
		CLO1	Apply different techniques in requirement elicitation (C3, PLO1)											

				CLO2	Con prec	Construct an appropriate representation technique in order to produce precise and complete requirement specification (C6, PLO5)									
				CLO3	Exp (C2	lain th , PLO	ne imp 6)	ortan	ce of	condu	cting	the requirem	nent analysis	correctly	
				CLO4	Pre PLC	oare tl 07)	he req	luirem	nent s	pecific	atio	n report in gro	oup assignme	nt (C6,	
9.	Mapping o Methods a	of the nd As	Cou	rse Lea ment:	arning	Outo	omes	s to t	he Pr	ogran	nmir	ng Learning	Outcomes, 1	Feaching	
	Course			Program	me Lea	rning C	Dutcom	es (PL	.0)						
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	PLO9	, т	eaching Method	ls Assess	sment	
	CLO1	3									Le	ecture, Tutorial	Progress T Final Exam Assignmen	est, ination, t	
	CLO2					3					Le	ecture, Tutorial	Progress T Final Exam	est, ination	
	CLO3						3				Le	ecture, Tutorial	Final Exam	est, ination	
	Note: $1 = 1$ it	tle Cont	ributio	n: 2 = Mc	oderate	Contrib	ution: 3	2 3 = Stro	na Col	ntributio	<u> L</u> е n	ecture	Assignmen	t	
				, _ = //(20.1010		000			••				
10.	Transferat	ole ski ole):	lls	Knowl Leade	edge; rship,	Value and T	s, Atti eam S	tudes Skills;	, and Mana	Profe: agerial	ssior and	nalism; Comm I Entrepreneu	nunication, rial Skills		
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:	Та	ahina		ooming Activiti			
								0		iching in a /E				Total	
	Col	irse Co	ntent	Outline		CLO	<u> </u>	Guideo	Lear	iing (r∡	25)	Learning	Learning	SLT	
						I	L	Т	Р	0	(NF2F)	(NF2F)			
	 Introduct Domain Support 	ction to Definit ting Too	Doma ions, E ols	in Analys Engineeri	is ng	1,3	3	2					2	4	
	 Supporting Tools Supporting Tools Introduction to Requirement Analysis Requirement Definitions Reasons of Difficulty of Requirement Analysis Important of Effective Requirement Analysis Requirement Errors and Cost 					1,3	3 2	2	2				4	8	
	 3. Types of Function Non-Function User Reference 	of Requinal Reconctiona	iremer juirem I Requ ients	nts ents iirements	i	1,3	3 2	2					2	4	
	 User Requirements Types of Requirements- cont. Software Requirement Document Requirements Characteristics Choosing a Requirements Specification Technique 					1,3	3 2	2	2				4	8	
	5. Requirement Process • Feasibility Studies • Requirements Elicitation					1,3	3 2	2					2	4	
	 6. Require Probler Require and Va Measur Require 	ement P n Analy ements lidation ing ements	rocess sis Docun and	s – cont. nentation Ma	anaging	1,3	3 2	2	2				4	8	
	 7. Analysi Require Communication 	s Conce ement A unicatio	epts ar nalysi n Tech	nd Princip s iniques	oles	1,3	3 2	2					2	4	

	 8. Analysis Concepts a cont. Analysis Principles Software Prototyping Specification 	and Principles –	1,3	2	2				4	8	
	 9. Requirements Elicita Requirements Stake Elicitation Guidelines Elicitation Process Elicitation Technique 	tion [1] holder s	1	2					2	4	
	 Analysis and Modelli Structured Analysis Object-Oriented Anal Automated Analysis Context Model 	ng Iysis Techniques	2,3	2	2				4	8	
	 Analysis and Modelli The Elements of Ana Data Modelling Functional and Beha Data Dictionary 	ng – cont. alysis Model viour Modelling	2,3	2					2	4	
	 Requirements Specific The Control Specific The Software Specification Introduction to Form Techniques 	2,3	2	2				4	8		
	 13. Designing and Mode Unified Modelling La Use Case Model [4] Class Model 	2,3	2					2	4		
	 14. Designing and Mode Component Model Dynamic Model: Sec Activity Diagram, Sta Process Diagram 	 14. Designing and Modelling – cont. Component Model Dynamic Model: Sequence Diagram, Activity Diagram, State Diagram, and Process Diagram 			2				4	8	
		Tot	al (SLT)	28	14	-	-	0	42	84	
	Continues	Assessment					Percer	ntage (%)		Total SLT	
	1. Progress Test							20		4	
	2. Assignment							30		18	
	3. Presentation							10		4 Total	
	Final Ass	sessment					Percer	ntage (%)		SLT	
	1. Final Examination							40		10	
		Tot	al (SLT)				1	00%		36	
	L = Lecture T = Tutorial P	= Practical O = O	thers E2E	- Face	to Face	NE2E	– Non	GRAN	ID TOTAL SLT	120	
12	Identify encodel			- 1 400		J, INI ∠I	- 11011				
12.	requirement or resources to deliver the course:										
13.	References:	Main reference Laplante, Auerbach	<u>ces:</u> P. (2017 n Publicat	7). <i>Req</i> tions.	uireme	nts eng	ineeri	ng for software	and systems (3rd ed.).	
	Online References: [1] GeeksforGeeks, "Software Engineering Requirements Elicitation," 2018 [Online]. Available: https://www.geeksforgeeks.org/software-engineering-requirements-elicitation/?ref=lbp.										

		[2] GeeksforGeeks, "How to write a good SRS for your Project," 2018. [Online]. Available: https://www.geeksforgeeks.org/how-to-write-a-good-srs-for-your- project/.
		 [3] "Software Requirement Specifications," Javatpoint, 2020. [Online]. Available: https://www.javatpoint.com/software-requirement-specifications. [4] GeeksforGeeks, "Designing Use Cases for a Project," 2018. [Online]. Available: https://www.geeksforgeeks.org/designing-use-cases-for-a-project/.
14.	Other additional information:	None

1.	Course Name	Profess	rofessional English: Essential Communication Skills								
2.	Course Code	UCS31	22								
3.	Academic Staff Name(s)	Nadira	Abdul Rah	iman							
4.	Rationale for the inclusion of the Course in the Programme	To prov languag profess	ride studer ge compet ionally.	nts with ar encies in	n understa order to b	nding of developi e able to perform	ng a communicative their job-related tasks				
5.	Semester and Year Offered	Semest	ter 2, Year	2							
6.	Total Student Learning Time (SLT)		Face to Face (F2F)Non Contact (Non F2F)Total Guided and Independent learning								
	L = Lecture	L	Т	Р	0						
	P = Practical O = Others	28	0	0	0	52	80				
7.	Credit Value	2									
8.	Prerequisite (if any)	None									
9.	Course Learning	Upon c	pon completion of this course, students should be able to:								
	Outcomes (CLOS)	CLO1	Demons settings	Demonstrate effective communication skills required in professional settings (C3, PLO1,3)							
		CLO2	Apply the technica PLO2)	e principle l papers,	es and pra oral prese	ctices of technica ntation and during	communication to reports, the job interviews (C3,				
		CLO3	Produce technica commun	good scie I descripti ication sk	entific and ions, techr tills (C6, P	technical writing, nical definitions, p LO8)	including mechanical and roposals and oral technical				
10.	Transferable Skills		Skills		Develop	oment Methods	Assessment Methods				
		Knowle	dge		Lecture	and Discussion	Q&A Session, Assignment, Presentation, Progress Test, Final Examination				
		Practica	al Skills		Lecture, Assignm	Discussion, ient	Assignment, Presentation,				
		Social S Respon	Skills and Isibilities		Lecture, Assignm	Discussion, lent	Q&A Session, Presentation, Assignment, Progress Test, Final Examination				

11.	Teaching-learning and Assessment Strategy	Teachi S	ng-Learning trategy	Assessn	nent Strategy	MQF LO Domain		
	on alogy	Lecture		Q&A Sess	sion,	Knowledge		
				Assignme Presentat Test, Fina	nt, ion, Progress I Examination	Practical Skills		
				1000, 1110		Social Skills and Responsibilities		
		Discussion	n	Q&A Sess Assignme	sion, ent,	Knowledge		
				Presentat Test, Fina	ion, Progress I Examination	Practical Skills		
				Social Skills and Responsibilities				
		Assignme	nt	Knowledge				
				Assignme Test, Fina	Practical Skills			
						Social Skills and Responsibilities		
12.	Synopsis	This cours communic principles advice and produce g suggested	se provides a con cation principles, of effective com d practical guide good technical wr d layouts and exp	e reference guide ractice in workpla both written and v to strengthen co duces the theory hat develop skills	e on technical ace. It explains the oral, and provides solid ommunication skills and r, specimen documents, and understanding.			
13.	Mode of Delivery	Lecture, D	Discussion, Assig	Inment				
14.	Assessment		Asse	essment		%		
	Methods and Types	Final Exar	mination			40		
		Continuou	us Assessment			60		
				Continuo	us Assessment			
		CLO	Teaching Strat	-learning tegy	Assessment	%		
		1,2,3	Lecture, Dis	scussion	Progress Test	10		
		1,2,3	Assignment		Assignment	50		
15.	Mapping of the	The object	ctives of the pro	ogramme ar	e:			
	Programme Aims	PEO 1	Graduates will l engineering fiel with appropriate	be employed d with good e attitude en	or self-employe level of knowled abling them to ha	d in relevant software ge and competency skills ave successful career		
		PEO 2 Graduates will acquire abilities collaborative working in diverse through professional involvement				communication, continual development		

		PEO 3 Graduates will pursue lifelong learning in order to contribute to advancement of information technology and computer science professions and related contemporary issues										9	
		Course	;			Progran	nme Ed	ucatior	al Obje	ectives			
		Learnin Outcom	g es		PEO 1			PEO 2			PEO 3		
		CLO 1			2								
		CLO 2			2								
		CLO 3						3					
		Note: 1 = L	ittle (Contributi	ion; 2 = Moo	derate Cor	ntribution;	3 = Stron	g Contrik	oution			
16.	Mapping of the	The learning outcomes of the programme are:											
	Programme Learning Outcomes	PLO 1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering										
		PLO 2	Ap	oply the	oretical p	rinciples	of Soft	ware En	gineerir	ng in rele	evant ar	eas	
		PLO 3	De pro im lar	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system									
		PLO 4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving										
		PLO 5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles										
		PLO 6	Function effectively both as individuals and in a group in the capacity of a leader or a team member										
		PLO 7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice							ng			
		PLO 8	Co co	ommuni ommuni	icate effeo ty and wit	ctively wi	ith the s ciety at	oftware large	system	develo	pment		
		PLO 9	Ap ca	oply skil reer de	ls and pri	nciples c nt	of lifelon	g learni	ng in bo	oth acad	emic an	d	
		Course				Progra	amme L	earning	g Outco	omes			
		Learnin Outcome	; g es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	
		CLO 1		1		2							
		CLO 2			2								
		CLO 3									3		
		derate Cor	ntribution;	3 = Stron	g Contrib	oution							

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		_						
		Stuc	lent Le	arning	Time (S	SLT)	(suno) (suno) (suno) (f) (f) (f) (f) (f) (f) (f) (f	
Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours	Progress To Assignmen Final Examination Progress To Assignmen Final Examination Progress To Assignmen Final Examination Progress To Assignmen Final Examination
1	 The Role of Oral Communication Essentials of Oral Communication Goals of Communication Preparing to Communicate Orally The Importance of Listening in Oral Communication Recall Listening Empathic Listening 	2	_	_	_	3	5	Progress T Assignme Final Examinati
2	 2. Professional Presentations Introduction to a Presentation Function of a Presentation Components of a Presentation 	2	-	-	Π	3	5	Progress T Assignme Final Examinati
3	 2. Professional Presentations - cont. Types of Presentation Technical Presentation Proposal Presentation Sales Presentation 	2	-	-	-	3	5	Progress T Assignme Final Examinati
4	 2. Professional Presentations - cont. Preparing and Delivering Presentations Gather support Materials Outline the Speech Delivery Considerations Creating and Using Visual Aids Controlling Nervousness and Stage Eright 	2	-	-	-	3	5	Progress T Assignme Final Examinati

5	 3. Writing Process Introduction to Writing Stages of Writing Determining your purpose Keeping your readers in mind Appealing to your audience Organizing and preparing an Outline 	2	-	-	_	4	6	Progress Test, Assignment, Final Examination
6	 3. Writing Process - cont. Drafting Revising Evaluating Proofreading 	2	-	-	-	4	6	Progress Test, Assignment, Final Examination
7	 4. Documents Introduction to Documents Types of documents: Instructions Minutes Articles Forms Sales documents New releases 	2	-	-	_	3	5	Assignment, Final Examination
8	 4. Documents - cont. Questionnaires 	2	-	-	-	3	5	Assignment, Final Examination
9	 5. Professional Interviews Introduction to the Employment Interview The Pre-Interview Stage Research Resume Cover Letter 	2	-	-	-	4	6	Assignment, Final Examination
10	 5. Professional Interviews - cont. The Interview Stage Presenting yourself in Interview (Verbal and Nonverbal Dimensions) 	2	-	-	-	3	5	Assignment, Final Examination
11	 5. Professional Interviews - cont. The Post-Interview Stage Getting the Job Offer Dealing with Rejection 	2	-	-	-	3	5	Assignment, Final Examination

	12	 6. Professional Growth Introduction to Professional Growth What is Continuous Professional Development (CPD) Benefits of CPD Opportunities of CPD 	2	-	-	-	3	5	Assignment, Final Examination
	13	 6. Professional Growth - cont. Ethics in Professions 	2	-	-	-	3	5	Assignment, Final Examination
	14	 6. Professional Growth - cont. Leadership skills The Leadership Role Decision Making in Groups and Team Meetings Conflicts in Group and Teams Promote and Ensure Team Effectiveness 	2	-	-	-	3	5	Assignment, Final Examination
	15	Revision	-	-	-		5	5	
	16-17	Examination	-	-	-	2	-	2	
		Total	28	-	-	2	50	80	
		Notional hours			4	0			
		Credit value				2			
18.	Main ref	erences supporting the course: Wiegers, K. & Beatty, J. (2013). Sof 9780735679665 Pohl, K. (2010). <i>Requirements engin</i> New York: Springer. ISBN: 9783642 hal references supporting the cour Pfleeger, S. & Atlee, J. (2010). Softw N.J: Prentice Hall. ISBN: 978013606	edmon s, princi ory and	d, Wasł ples, ar practic	nington: nd techr e. Uppe	Microsoft. ISBN: niques. Heidelberg er Saddle River			

- Sommerville, Ian. Software engineering. Boston: Pearson, 2011. Print. ISBN: 9780137035151
- Hull, Elizabeth, Ken Jackson, and Jeremy Dick. *Requirements engineering*. London: Springer, 2005. Print. ISBN: 1-85233-879-2

1.	Course Name	Hubung	lubungan Etnik										
2.	Course Code	MPU31	13										
3.	Academic Staff Name(s)	Nabillał	n Bolhassa	an									
4.	Rationale for the inclusion of the Course in the Programme	Mening konsep juga dic perlemt	katkan pe -konsep a ledahkan bagaan da	mahamar sas hubui dengan ki ilam konte	n pelajar-p ngan etnik onsep per eks hubun	elajar tentang kor a, pluraliti dan mas nbangunan politik gan etnik di Malay	nsep kesepaduan sosial, syarakat pluralistik. Pelajar , ekonomi dan ysia.						
5.	Semester and Year Offered	Semest	ter 3, Year	r 2									
6.	Total Student Learning Time (SLT)		Face to Face (F2F)Non Contact (Non F2F)Total Guided and Independent learning										
	L = Lecture	L	Т	Р	0								
	P = Practical O = Others	42	0	0	0	78	120						
7.	Credit Value	3											
8.	Prerequisite (if any)	None	lone										
9.	Course Learning	Upon c	Upon completion of this course, students should be able to:										
	Outcomes (CLOS)	CLO1	Menerar dalam m	ngkan per nemupuk p	anan integ perpaduar	grasi budaya, mas n. (C2, PLO1)	yarakat dan kumpulan etnik						
		CLO2	Mengen konteks	alpasti ca permuafa	baran plur katan inte	ralisasi budaya da grasi di Malaysia	n pelaksanaannya dalam (C2, PLO5)						
		CLO3	Mengap mewujuo	likasi kem dkan mas	ahiran inte yarakat be	egrasi dalam kala ersatu padu (C3, F	ngan pelajar integrasi PLO8)						
		CLO4	Mengan Malaysia	alisis isu-i a (C4, PL0	su dan ca C9)	baran dalam kont	eks hubungan etnik di						
10.	Transferable Skills	Skills			Develop	oment Methods	Assessment Methods						
		Knowle	dge		Kuliah		Ujian penilaian dan peperiksaan akhir						
		Social S Respor	Skills and Isibilities		Kuliah, k	kajian kes	Pembentangan dan peperiksaan akhir						
		Values, Profess	Attitudes sionalism	and	Kuliah, t dan kajia	ugasan bertulis, an kes	Laporan tugasan bertulis, peperiksaan akhir.						
		Informa and Life Skills	Information Management and Lifelong LearningTugasan bertulis, Kajian kesLaporan tugas Pembentanga penilaian dan akhir										

11.	Teaching-learning and Assessment	Teaching∙ Strat	Learning tegy	Assessm	nent Strategy	MQF LO Domain				
	Strategy	Kuliah		Ujian peni Tugasan k Pembenta Peperiksa	laian, pertulis, ingan, an akhir	Knowledge				
		Kajian Kes		Tugasan t	pertulis,	Knowledge				
				Pembenta	ingan	Social Skills and Responsibilities; Values, Attitudes and Professionalism				
						Information Management and Lifelong Learning Skills				
		Perbincanga	n	Tugasan t Pembenta	pertulis, Ingan	Knowledge; Values, Attitudes and Professionalism				
					Information Management and Lifelong Learning Skills					
		Tugasan Ber	tulis	Tugasan t Pembenta	pertulis, Ingan	Knowledge; Social Skills and Responsibilities; Values, Attitudes and Professionalism				
						Information Management and Lifelong Learning Skills				
12.	Synopsis	Kursus ini m mana ianya i adalah untu kesepaduan integrasi da pembanguna etnik di Mala sumbangan k	emfokuskan p merupakan pr uk meningka sosial, potret an masyarak n ekonomi, d aysia, integra kerajaan dan r	perbincanga oses hubur tkan pema hubungan kat integra lan perlemb si dan mer nasyarakat	n tentang hubur Igan sosial yang ahaman pelaja etnik, konsep-ko si di Malaysi bagaan Malaysia nangani cabarar dan inter-etnik d	gan etnik di Malaysia yang dinamik. Tujuan kursus ini r-pelajar tentang konsep nsep asas hubungan etnik, a, pembangunan politik, dalam konteks hubungan a, agama dan masyarakat, an intra-etnik.				
13.	Mode of Delivery	Kuliah, Perbi	h, Perbincangan, Pembentangan							
14.	Assessment Methods and Types		Asse	ssment		%				
	methodo una Typeo	Peperiksaan	Akhir	50						
		Penilaian Bei	rterusan			50				
				Continuo	us Assessment					
		CLO	Teaching- Strate	learning egy	Assessment	%				

r										
		1, 2		Kuliah	Ujian Penilaian	15				
		1, 2, 3		Kuliah, kajian kes, Perbincangan	Tugasan Bertulis	20				
		1, 2, 3		Kuliah, tugasan bertulis, dan kajian kes	Pembentangan	15				
15.	Mapping of the	The object	tiv	ves of the programme ar	e:					
	Course to the Programme Aims	PEO 1	Gr en wi	raduates will be employed ngineering field with good th appropriate attitude en	l or self-employed i level of knowledge abling them to have	n relevant software and competency skills successful career				
		PEO 2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement							
		PEO 3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related contemporary issues							
		Course		Program	me Educational C	Dbjectives				
		Outcome		PEO 1	PEO 2	PEO 3				
		CLO 1		1						
		CLO 2			2					
		CLO 3			3					
		CLO 4				2				
		Note: 1 = Lit	tle (Contribution; 2 = Moderate Con	tribution; 3 = Strong Co	ntribution				
16.	Mapping of the	The learn	ing	outcomes of the progra	amme are:					
	Programme Learning Outcomes	PLO 1	Ap pri	oply knowledge and under inciples, skills, and theorie	rstanding of essent es relating to Softw	al facts, concepts, are Engineering				
		PLO 2	Ap	oply theoretical principles	of Software Engine	ering in relevant areas				
		PLO 3 Demonstrate appropriate methodologies, models, technique provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation large-scale software system								
		PLO 4	Us sk	se relevant techniques an ills in problem solving	d demonstrate ana	lytical and critical thinking				
		PLO 5	Co etl	onduct professional and e hical and legal principles	thical responsibilitie	es in accordance with				
		PLO 6	Function effectively both as individuals and in a group in the capacity of a leader or a team member							
		PLO 7	Apply broad business and real world perspectives daily and							

				demonstrate entrepreneurship skills related to software engineering practice										
			PLO 8	Commun communi	icate ef ty and v	fectively vith the	/ with th society	ne softv v at larg	vare sys e	stem de	development			
			PLO 9	Apply ski career de	Apply skills and principles of lifelong learning in both academic and areer development									
			Course		Programme Learning Outcomes									
			Learning Outcome	PLO 1	PLO 2	PLO 3	PLO 4			0 G	PLO 7	PLO 8	PLO 9	
			CLO 1	1										
			CLO 2						2					
			CLO 3									3		
			CLO 4										2	
			Note: 1 = Li	lote: 1 = Little Contribution; 2 = Moderate Contribution; 3 = Strong Contribution										
17.	Content Outline of the Course and the SLT per Topic													
		Student Learning Time (SLT)												
	Week Course Materials				Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)		Assessment		
	 1. Malaysia : Kesepaduan Dalam Kepelbagaian Sebuah Negara, Dua Imaginasi Sosiologikal: Antara "Perpaduan' atau 'Kesepaduan' Hubungan Etnik di Malaysia Masyarakat Pelbagai Etnik di Malaysia Kesepaduan Sosial: Pandangan Alternatif untuk Memahami Hubungan Etnik di Malaysia Kesepaduan Sosial Melalui Akomodasi, Akulturasi, Amalgamasi dan Asimilasi 			3	-	-	-	5	8	Pr A E	ogress \ssignm Final Examina	Test, ent, tion		

2	 2. Potret Hubungan Etnik Kesultanan Melayu Melaka Lambang Pertemuan Masyarakat Pelbagai Etnik Pembentukan Masyarakat Majmuk Era Kolonialisme British 	3	-	-	_	5	8	Progress Test, Assignment, Final Examination
3	 2. Potret Hubungan Etnik - cont. Fokus Hubungan Etnik Kerangka Teori Kerangka Konseptual Meneliti Konsep Ras dan Etnik di Malaysia 	3	-	-	-	5	8	Progress Test, Assignment, Final Examination
4	 2. Potret Hubungan Etnik - cont. Budaya Konsep Prejudis, Stereotaip dan Diskriminasi Kerangka Teoretis Konsep-konsep Tahap Hubungan Etnik 	3	-	_	-	5	8	Progress Test, Assignment, Final Examination
5	 3. Limpahan Kemakmuran Merentasi Hubungan Etnik Isu Sosioekonomi Pada Awal Kemerdekaan Ekonomi Menjadi Isu Etnik Dasar Ekonomi Baru Kejayaan Ekonomi Malaysia Isu dan Cabaran 	3	-	-	-	5	8	Progress Test, Assignment, Final Examination
6	 4. Perlembagaan Persekutuan : Tiang Seri Hubungan Etnik Definisi dan Konsep Perlembagaan Sejarah Penggubalan Perlembagaan Persekutuan Malayan Union 	3	-	-	-	5	8	Assignment, Final Examination

7	 4. Perlembagaan Persekutuan : Tiang Seri Hubungan Etnik - cont. Persekutuan Tanah Melayu 1948 Kerjasama Antara Etnik dalam Menuju Kemerdekaan Suruhanjaya Reid Jawatankuasa Kerja dan Perisytiharan Perlembagaan 	3	-	_	-	5	8	Assignment, Final Examination
8	 4. Perlembagaan Persekutuan : Tiang Seri Hubungan Etnik - cont. Unsur-Unsur Tradisi dalam Perlembagaan Persekutuan Kesultanan atau Pemerintahan Beraja Isu-Isu Islam dan Orang Melayu dalam Perlembagaan asar Ekonomi Baru, Dasar Pembangunan Negara dan Dasar Wawasan Negara dan hubungan etnik 	3	-	_		5	8	Assignment, Final Examination
9	 5. Permuafakatan Politik Dalam Konteks Hubungan Etnik di Malaysia Pembangunan Politik Pemupukan Hubungan Etnik Secara Formal dalam Politik Demografi dan Politik 	3	-	_	-	5	8	Assignment, Final Examination
10	 5. Permuafakatan Politik Dalam Konteks Hubungan Etnik di Malaysia - cont. Pakatan Politik di Sabah dan Sarawak Tsunami Politik: Politik Perkauman Semakin Mengendur Perubahan Trend dan Corak Pengundian 	3	-	-	-	5	8	Assignment, Final Examination

11	 6. Kepelbagaian Agama : Mencari Titik Pertemuan Takrif Agama Mengapakah Manusia Beragama? Peranan Agama Penggolongan Agama Agama-agama di Malaysia Konflik Agama Mencari Titik Pertemuan 	3	-		-	5	8	Assignment, Final Examination
12	 7. Dari Segragasi ke Integrasi Dari Pengasingan ke Penyatuan Cabaran dalam Memupuk Integrasi di Malaysia Peranan Kerajaan Peranan Masyarakat dalam Konteks Hubungan Etnik Peranan NGO dalam Konteks Hubungan Etnik 	3	-	_	-	5	8	Assignment, Final Examination
13	 8. Pemerkasaan Pendidikan ke Arah Kesepaduan Sosial Sejarah Pendidikan di Malaysia dan Hubungan Etnik Latar Belakang Pendidikan Komuniti Etnik di Tanah Melayu Sekolah Vernakular Inggeris Sekolah Kebangsaan dan Sekolah Vernakular Cabaran dalam Pendidikan dan Bahasa 	3	-	_	_	5	8	Assignment, Final Examination
14	 9. Pengalaman Harian : Menjalin Kesepaduan dan Melahirkan Keharmonian Kepelbagaian Makanan Etnik Pemangkin Perpaduan Makanan dan Ruang Sosial dalam Konteks Hubungan Etnik Kesenian Pelbagai Etnik dan Kesepaduan Sosial Media dan Kesepaduan Sosial 	3	-	-	-	5	8	Assignment, Final Examination
15	Revision	-	-	-	-	5	5	

	16-17	Examination	-	-	-	3	-	3	
		Total	42	-	-	3	75	120	
		Notional hours			4	0	1	1	
		Credit value		3	3				
 Shamsul Amri Baharuddin. (2013). Modul Hubungan Etnik, Edisi kedua. Bangi: Institut Kajian Etnik UKM. Zaid Ahmad et.al. (2013). Hubungan Etnik di Malaysia, Edisi ketiga. Shah Alam: Oxford Fajar. Additional references supporting the course: Abdul Aziz Bari. (2001). Perlembagaan Malaysia: Asas-asas dan Masalah. Kuala Lumpur: Dewan Bahasa dan Pustaka. Abdul Rahman Haji Embong. (2000). Negara Bangsa: Proses dan Perbahasan. Bangi: Penerbit Universiti Kebangsaan Malaysia. Nazri Muslim & Nasruddin Yunos. (2006). Hubungan Etnik. Bangi: Pusat Pengajian Umum, Universiti 								tut Kajian Etnik ford Fajar. Impur: Dewan gi: Penerbit Umum, Universiti	

• Wan Mohd Nor Wan Daud. (2001). *Pembangunan di Malaysia*. Kuala Lumpur: ISTAC.

1.	Course Name	Tamadu	Tamadun Islam dan Tamadun Asia (TITAS)							
2.	Course Code	MPU31	23							
3.	Academic Staff Name(s)	Nabillał	n Bolhassa	an						
4.	Rationale for the inclusion of the Course in the Programme	Mempe pengen kontem melahir nilai-nila	rkenalkan alan ilmu l porari dan kan pelaja ai murni da	kepada p ketamadu i implikasi ar yang me an mempu	elajar ten nan, inter nya kepao empunyai unyai jati o	tang ilmu ketamad aksi antara pelbag la proses pembar sikap hormat mer liri sebagai warga	dunan yang mencakupi gai tamadun, Isu-isu ngunan Negara. Di samping nghormati, mengamalkan negara.			
5.	Semester and Year Offered	Semest	er 3, Year	2						
6.	Total Student Learning Time (SLT)		Face to Face (F2F)Non Contact (Non F2F)Total Guided and Independent learning							
	L = Lecture	L	Т	Р	0					
	P = Practical O = Others	42	0	0	0	78	120			
7.	Credit Value	3					·			
8.	Prerequisite (if any)	None								
9.	Course Learning	Upon c	ompletio	n of this o	course, s	tudents should b	e able to:			
	Outcomes (CLOS)	CLO1	Menyena Asia (C3	araikan ko 8, PLO1)	onsep-kon	sep utama Tamao	dun Islam dan Tamadun			
		CLO2	Menerar masing o	ngkan kep dalam keh	entingan iidupan (C	dan peranan agar 2, PLO5)	na dan budaya masing-			
		CLO3	Mengapl dan lisar	likasi kem n di pering	ahiran ko Ikat individ	munikasi secara b du, kumpulan dan	erkesan dalam penulisan masyarakat (C3, PLO8)			
10.	Transferable Skills		Skills		Develop	oment Methods	Assessment Methods			
		Knowle	dge		Kuliah		Ujian penilaian dan peperiksaan akhir			
		Values, profess	attitudes ionalism	and	Kuliah, k	ajian kes	Pembentangan dan peperiksaan akhir			
		Social s respons	skills and sibilities		Kuliah, t dan kajia	ugasan bertulis, an kes	Laporan tugasan bertulis, peperiksaan akhir.			
11.	Teaching-learning and Assessment	Teac	hing-Lea Strategy	rning	Assess	ment Strategy	MQF LO Domain			
	Strategy	Kuliah			Pemben Tugasar penilaiai akhir	tangan, n bertulis, Ujian n, Peperiksaan	Knowledge			

		Kajian Kes Kursus ini membincangkan			Tugasan bertulis, Peperiksaan akhir Pembentangan, Tugasan bertulis, Peperiksaan akhir			Values, Attitudes and Professionalism Social Skills and Responsibilities Knowledge Values, Attitudes and Professionalism Social Skills and Responsibilities		
12.	Synopsis	Kursus ini membincangkan tentang ilmu ketamadunan yang mencakupi pengenalan ilmu ketamadunan, interaksi antara pelbagai tamadun Melayu, Cina dan India, Islam dalam Tamadun Melayu, Isu-isu kontemporari Tamadun Islam dan Tamadun Asia, Islam Hadhari dan proses pembangunan negara.								
13.	Mode of Delivery	Kuliah, Pe	Kuliah, Perbincangan, Pembentangan.							
14.	Assessment Methods and Types			Assess	sment			%		
	methous and Types	Peperiksa	aan A	Akhir		50				
		Penilaian	Bert	terusan				50		
				(Continuous Assessment					
		CLO		Teaching-le Strateg	arning }y	Assessment		%		
		1, 2, 3		Kuliah	Ujian Penilaia			15		
		1, 2, 3		Perbincangan	n Tugasan Bertulis			20		
		1, 2, 3		Pembentanga	n	Pembentangan	ı	15		
15.	Mapping of the	The obje	ctive	es of the progr	ramme ar	e:				
	Programme Aims	PEO 1	Gra enç witl	aduates will be gineering field v h appropriate a	employed with good attitude ena	l or self-employe level of knowledg abling them to ha	d in re ge and ave sud	levant software l competency skills ccessful career		
		PEO 2	Gra col thro	aduates will acc laborative work ough professior	quire abilit king in dive nal involve	ies for effective o erse teams, and o ement	commu continu	unication, ual development		
		PEO 3	Gra adv pro	aduates will pur vancement of ir ofessions and re	rsue lifelor nformation elated con	ng learning in orc technology and temporary issues	ler to c compi s	contribute to the uter science		
		Course			Program	me Educationa	l Objectives			
		Outcome	y es	PEO 1	01 PEO 2			PEO 3		

		CLO 1			2							
		CLO 2			1							
		CLO 3			3							
		Note: 1 = Li	ittle (Contribut	ion; 2 = Mo	derate Cor	ntribution;	3 = Stroi	ng Contrib	oution		
16.	Mapping of the	The learn	ning	g outco	mes of t	he progr	amme	are:				
	Programme Learning Outcomes	PLO 1	Ар pr	oply kno inciples	owledge a s, skills, a	and unde nd theori	rstandir es relat	ng of es ing to S	sential f oftware	acts, co Engine	ncepts, ering	
		PLO 2	Ap	oply the	oretical p	rinciples	of Soft	ware En	igineerir	ng in rele	evant ar	eas
		PLO 3	De pr im lai	emonst ovide a iplemer rge-sca	rate appro basis for ntation, ev le softwa	opriate m analysis valuation re systen	nethodo , desigr , mainte n	logies, r 1, devel enance,	nodels, opment, and doo	techniq test an cumenta	ues that d ation of a	3
		PLO 4	U: sk	se relev ills in p	vant techr roblem so	niques ar olving	id demo	onstrate	analytic	al and o	critical th	ninking
		PLO 5	Co et	onduct hical ar	professio nd legal p	nal and e rinciples	ethical re	esponsi	bilities ir	n accord	dance w	ith
		PLO 6	6 Function effectively both as individuals and in a group in the capacity of a leader or a team member									
		PLO 7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice									
		PLO 8	2LO 8 Communicate effectively with the software system development community and with the society at large									
		PLO 9	Ap ca	oply ski reer de	lls and pr evelopme	inciples ont	of lifelon	g learni	ng in bo	oth acad	lemic an	d
		0				Progra	amme L	earnin	g Outco	omes		
		Learnin Outcome	es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
		CLO 1		2								
		CLO 2						1				
		CLO 3									3	
		Note: 1 = Li	ittle	Contribut	ion; 2 = Mo	derate Cor	ntribution;	3 = Stroi	ng Contrib	oution		

oontent		perio	opic					
		Stuc	lent Le	arning	SLT)			
Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)	Assessment
1	 Pengenalan Ilmu Ketamadunan Konsep Ketamadunan Interaksi Antara Tamadun 	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio
2	 Pengenalan Ilmu Ketamadunan - cont. Dialog Antara Tamadun 	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio
3	 2. Tamadun Islam Pandangan Semesta Tamadun Islam Konsep, Sumber dan Asas 	3	-	-	-	5	8	Progress Te Assignmen Final Examinatio
4	 2. Tamadun Islam - cont. Kelahiran, Perkembangan dan Kemerosotan Prinsip dan Ciri-Ciri Sumbangan Tamadun Islam dan Jihad 	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio
5	3. Tamadun MelayuKonsepAsas	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio
6	 3. Tamadun Melayu - cont. Pandangan Semesta Pencapaian 	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio
7	 4. Tamadun India Konsep Wilayah dan Masyarakat 	3	-	-	-	5	8	Progress Te Assignmer Final Examinatio

8	 4. Tamadun India - cont. Pandangan Semesta Kepelbagaian Agama 	3	-	-	-	5	8	Progress Test, Assignment, Final Examination
9	 4. Tamadun India - cont. Peranan Islam Dalam Tamadun India Pencapaian 	3	-	-	-	5	8	Assignment, Final Examination
10	 5. Tamadun Cina Konsep Wilayah dan Masyarakat Pandangan Semesta 	3	-	-	-	5	8	Assignment, Final Examination
11	 5. Tamadun Cina - cont. Kepelbagaian Falsafah dan Agama Institusi Politik, Sistem Pemerintahan 	3	-	-	-	5	8	Assignment, Final Examination
12	 5. Tamadun Cina - cont. Kekeluargaan Pencapaian 	3	-	-	-	5	8	Assignment, Final Examination
13	 6. Isu-isu semasa dan cabaran masa depan Dunia Berbilang Tamadun Cabaran Globalisasi 	3	-	-	-	5	8	Assignment, Final Examination
14	 6. Isu-isu semasa dan cabaran masa depan - cont. Teori Pertembungan Tamadun Dialog Peradaban Pemupukan Nilai-Nilai Sepunya Isu-Isu Dalam Dialog Tamadun 	3	-	-	-	5	8	Assignment, Final Examination
15	Revision	-	-	-	-	5	5	
16-17	Examination	-	-	-	3	-	3	
	Total	42	-	-	3	75	120	
	Notional hours			4	0			

	Credit value	3	
18.	 Main references supporting the course: Kementerian Pengajian Tinggi. (2009). Lumpur: Penerbit Universiti Malaya. Ahmad Zaki Abdul Latif, Azam Hamzal Asia. Shah Alam: Oxford Fajar 	Modul Pengajian Tamadun Islam dan Tamac n dan Azhar Mad Aros. (2012). Tamadun Islar	lun Asia. Kuala m dan Tamadun
	 Additional references supporting the cou Al-Buti, Muhammad Said Ramadhan. (<i>Pelaksanaan Islam Hadhari di Malaysia</i> Hadhari. Syed Muhammad Naquib al-Attas. (19 Kebangsaan Malaysia. Universiti Malaya. (2001). <i>Tamadun Isl</i> Malaya. Zulkifli Mohamad, Nasaruddin Yunos 8 	u rse: 2004). <i>Islam Hadhari dalam Pembangunan In</i> a) Terj. Muhammad Ramzi bin Omar. Putrajay 71). <i>Islam dan Sejarah Kebudayaan Melayu</i> . I <i>lam dan Tamadun Asia</i> . Kuala Lumpur: Pener	asan (Asas kepada ya: Yayasan Islam Bangi: Universiti bit Universiti am dan Tamadun

1.	Course Name	Malays	Malaysian Economy							
2.	Course Code	MPU33	312							
3.	Academic Staff Name(s)	Nurzali	kha Binti S	Sa'adi						
4.	Rationale for the inclusion of the Course in the Programme	This co Malays the gov to equip	urse is air ian Econo vernment a p them wit	ned at giv my. Besi and its pla h necess	ving stude des, this c ans and po ary skills a	nts an introductor course also to exp plicies. The knowle and awareness fo	y insight into the ose students on the role of edge is necessary in order r future endeavor.			
5.	Semester and Year Offered	Semes	ter 3, Yea	r 2						
6.	Total Student Learning Time (SLT)		Face to F	ace (F2F	;)	Non Contact (Non F2F)	Total Guided and Independent learning			
	L = Lecture	L	Т	Р	0					
	P = Practical O = Others	28	0	0	0	52	80			
7.	Credit Value	2								
8.	Prerequisite (if any)	None								
9.	Course Learning	Upon o	completio	n of this	course, s	students should	be able to:			
	Outcomes (CLOS)	CLO1	Understa PLO1)	and the N	lalaysia e	conomy structure	and its components (C2,			
		CLO2	Analyze external	the macr factors ir	ro econom 1 business	y environment an decision making	d social issues and the (C4, PLO2)			
		CLO3	Evaluate economi PLO9)	e the role: ic develo	s of the go pment its i	overnment and its impact on Malaysi	plans and policies for an competitiveness (C5,			
10.	Transferable Skills		Skills		Develop	oment Methods	Assessment Methods			
		Knowle	edge		Lecture		Quizzes / Progress Test, Presentation, Assignment, Final Examination			
		Lifelong Informa Manage	g Learning ation ement Ski	ı and Ils	Lecture, Group D	Assignment, iscussion	Quizzes / Progress Test, Presentation, Assignment, Final Examination			
11.	Teaching-learning and Assessment	Теас	hing-Lea Strategy	rning	Assess	ment Strategy	MQF LO Domain			
	Strategy	Lecture)		Quizzes Test, Pro Assignm Examina	/ Progress esentation, eent, Final ation	Knowledge			

				Lifelong Learning and Information Management Skills											
		Assignme	ent	Quizzes / Test, Pres Assignme Examinati	Progress entation, nt, Final on	Lifelong Learning and Information Management Skills									
		Group Ac	tivity	Quizzes / Test, Pres Assignme Examinati	Progress entation, nt, Final on	Lifelong Learning and Information Management Skills									
12.	Synopsis	This cour and its ed discussed governme social iss and polic and SDC	This course provides the student with an overview of the Malaysian economy and its economic interaction with other countries. Various topics will be discussed, including: The fundamental of Malaysian Economic structure, government policies, economic sectors (agricultural and industrial, services), social issues (education, poverty, population, labour force) and economic plans and policies towards high income economy (Iskandar, NCER, ECER, SCORE, and SDC).												
13.	Mode of Delivery	Lecture,	Assignment, Gro	up Activity											
14.	Assessment		Asse	ssment		%									
	Methods and Types	Final Exa	mination	40											
		Continuo	us Assessment	60											
				Continuo	us Assessment										
		CLO	Teaching- Strate	learning egy	Assessment	%									
		1, 2, 3	Assignment		Assignment	40									
		1, 2, 3	Group Activ	ity	Presentation	10									
		1, 2, 3	Lecture		Quizzes / Progress Test	10									
15.	Mapping of the	The obje	ctives of the pro	arommo o	Progress Test										
	Course to the	PEO 1 Graduates will be employed or self-employed in relevant software engineering field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career													
	Course to the Programme Aims	PEO 1	Graduates will I engineering fiel with appropriate	be employed d with good e attitude en	re: d or self-employe level of knowled abling them to h	ed in relevant software ge and competency skills ave successful career									
	Course to the Programme Aims	PEO 1 PEO 2	Graduates will I engineering fiel with appropriate Graduates will a collaborative we through profess	be employed d with good e attitude en acquire abili prking in div sional involv	re: d or self-employe level of knowled abling them to h ties for effective erse teams, and ement	ed in relevant software ge and competency skills ave successful career communication, continual development									
	Course to the Programme Aims	PEO 1 PEO 2 PEO 3	Graduates will I engineering fiel with appropriate Graduates will a collaborative we through profess Graduates will p advancement o professions and	be employed d with good e attitude en acquire abili prking in div sional involv bursue lifelo f information d related con	re: d or self-employed level of knowled labling them to h ties for effective erse teams, and ement ng learning in or n technology and ntemporary issue	ed in relevant software ge and competency skills ave successful career communication, continual development der to contribute to the d computer science									
		Course	;	Programme Educational Objectives											
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		Learnin Outcom	g es		PEO 1			PEO 2			PEO 3				
		CLO 1			3										
		CLO 2			2										
		CLO 3									2				
		Note: 1 = L	ittle	Contribu	tion; 2 = M	oderate Co	ontributior	n; 3 = Str	ong Contr	ibution					
16.	Mapping of the	The lear	ning	g outco	omes of	the prog	Iramme	are:							
	Programme Learning	PLO 1	Ар pr	oply kno inciples	owledge s, skills, a	and unde	erstandi ies rela	ing of e ting to \$	ssential Software	facts, c e Engine	oncepts eering	3 ,			
	Outcomes	PLO 2	Ap	oply the	oretical	orinciples	s of Soft	ware E	ngineer	ing in re	elevanta	areas			
		PLO 3	De pr im lai	emonst ovide a plemer rge-sca	rate appi basis fo ntation, e lle softwa	opriate r r analysis valuatior re syste	nethodo s, desig n, maint m	ologies, n, deve enance	models lopmen , and do	, techni t, test a ocument	ques thand nd tation of	at fa			
		PLO 4	Us thi	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving											
	-	PLO 5	Co et	Conduct professional and ethical responsibilities in accordance with ethical and legal principles											
		PLO 6	Function effectively both as individuals and in a group in the capacity of a leader or a team member												
		PLO 7	Ap de pr	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice											
		PLO 8	Co co	Communicate effectively with the software system development community and with the society at large											
		PLO 9	Ap ca	oply ski reer de	lls and prevelopme	rinciples ent	of lifelo	ng learr	ning in b	oth aca	demic a	and			
		Course	•			Progra	mme L	earnin	g Outco	omes					
		Learnin Outcom	g es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9			
		CLO 1		3											
		CLO 2			2										
		CLO 3										2			
		Note: 1 = Little Contribution; 2 = Moderate Contribution; 3 = Strong Contribution													

		C1			Time of the			
		Stud	lent Le	arning	l ime (SLI)	(1	t
Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours	Assessmen
1	 Overview of Malaysia Economy Introduction British Colonization Policies in Malaysia Impact of British Colonization on Socio- Economic Problems 	2	-	_	_	3	5	Progress Test, Assignme Final Examination
2	 Overview of Malaysia Economy - cont. Malaysian Economic Structure (Before and After Independence Economic Development Plans Other Vision, Policies, Plans and Issues 	2	-	-	-	3	5	Progress Test, Assignme Final Examinati
3	 2. Economic Development Concept Collin Clark hypothesis 	2	-	-	-	3	5	Progress Test, Assignmen Final Examination
4	 3. Development of Agriculture Importance of Agricultural Sector Development of Agricultural Sector Agricultural Development Programme Issues and Challenges Faced by the Agricultural Sector Strategies for the future survival of the agricultural acetor 	2	-	-	_	3	5	Progress Test, Assignme Final Examinati

5	 3. Development of Agriculture cont. Importance of Agricultural Sector Development of Agricultural Sector Agricultural Sector Agricultural Development Programme Issues and Challenges Faced by the Agricultural Sector Strategies for the future survival of the agricultural sector 	2	-	_		3	5	Progress Test, Assignment, Final Examination
6	 4. The Industrial Sector Industrial Development of Malaysia Phases of industrial policy Role of Industrial Sector in Malaysian Economy 	2	-	-	-	3	5	Progress Test, Assignment, Final Examination
7	 4. The Industrial Sector - cont. Industrial Development Policies Development of Small and Medium Industries in Malaysia Role of Heavy Industries in Malaysian Economy 	2	-	-	-	3	5	Progress Test, Assignment, Final Examination
8	 4. The Industrial Sector - cont. Foreign Direct Investment Challenges in the Industrial Sector 	2	-	-	-	3	5	Progress Test, Assignment, Final Examination
9	 5. Education and Human Capital Formation Malaysia's education system in historical perspective Financing education Expansion in education: meeting quantitative targets Quality issues in education 	2	-	-	-	3	5	Assignment, Final Examination

10	 6. Population, Labour Force and Human Capital Issues Population Size, Trend and Annual Percentage Growth Rate Labour Force and Employment in Primary, Secondary and Tertiary Sectors Labour Force Issues 	2	-	-	-	3	5	Assignment, Final Examination
11	 7. Poverty and Income Distribution Definition of Poverty Causes of Poverty Measures of Eradicate Poverty 	2	-	-	-	3	5	Assignment, Final Examination
12	 7. Poverty and Income Distribution - cont. Income Distribution Why poverty eradication and income distribution is important? Government policy on poverty and distribution 	2	-	_	-	3	5	Assignment, Final Examination
13	 8. Key growth engines Iskandar Malaysia Northern Corridor Economic Region (NCER) 	2	-	-	-	3	5	Assignment, Final Examination
14	 8. Key growth engines - cont. East Coast Economic Region (ECER) Sarawak Corridor Renewable Energy (SCORE) Sabah Development Corridor 	2	-	-	-	3	5	Assignment, Final Examination
15	Revision	-	-	-	-	8	8	
16-17	Examination	-	-	-	2	-	2	
Total		28	-	-	2	50	80	
Notional hours				4	0			
Credit value		2						

Main references supporting the course:
Habibah Lehar, Yaacob Anas, Tey Hwei Choo (2014). Malaysian Economy. Oxford Fajar.
Rajah Rasiah (2011). Malaysian Economy. Kuala Lumpur: Penerbit Fajar Bakti.
Additional references supporting the course:
Nil.

1.	Course Name	Bahasa	Kebangs	aan							
2.	Course Code	UCS34	12								
3.	Academic Staff Name(s)	Dayang) Nazirah	Awang Si	ihat						
4.	Rationale for the inclusion of the Course in the Programme	Untuk r kemahi menyeo seperti dan kua lain-lair	Untuk mendedankan kepada pelajar dengan kepelbagaian pengetahuan, kemahiran dan teknik untuk kesedaran pembelajaran sepanjang hayat. Ia juga menyediakan platform kepada pelajar untuk meggunakan kemahiran insaniah seperti komunikasi, kemahiran pengurusan. Melalui penglibatan pelajar, ciri-ciri dan kualiti pelajar, seperti kepimpinan, kerja berpasukan, keyakinan diri, dan ain-lain akan terhasil dengan adanya penglibatan pelajar.								
5.	Semester and Year Offered	Semest	Semester 3, Year 2								
6.	Total Student Learning Time (SLT)		Face to Face (F2F) Non-Contact Total Guided and (Non F2F) Independent learnin								
	L = Lecture T = Tutorial P = Practical O = Others	L 28	Т 0	P 0	0 0	52	80				
7.	Credit Value	2	2								
8.	Prerequisite (if any)	None	None								
9.	Course Learning	Upon c	ompletio	on of this	course, s	students should I	be able to:				
	Outcomes (CLOS)	CLO1	Menggu tulisan (nakan Ba C3, PLO1	hasa Mel)	ayu dengan berke	san dari segi lisan dan				
		CLO2	Berkomi intonasi,	unikasi se , tatabaha	ecara lisar asa, kosa	n dengan berkesar kata, unkapan dar	n dari segi sebutan dan I laras (C2, PLO6)				
		CLO3	Memaha seterusr Bahasa	ami bahar iya meng yang beti	n bertulis y ungkapak ul dan ber	yang beraneka jen an fikiran secara li kesan (C2, PLO9)	is dan gaya, dan san dan bertulis dengan				
10.	Transferable Skills		Skills		Develo	oment Methods	Assessment Methods				
		Knowle	dge		Pembela dan kola	ajaran koperatif Iboratif	Penilaian penyertaan kelas, penilaian pensyarah , persembahan tugasan				
Communication, Leadership and TeamPembelajaran koperatif dan kolaboratifPenilaian kelas, per pensyarat persemba						Penilaian penyertaan kelas, penilaian pensyarah , persembahan tugasan					
		Informa Manage Lifelong	ition ement and g Learning	d g Skills	Penyele berdasa kerja	saian masalah rkan kertas	Penilaian kemahiran				

11.	Teaching-learning and Assessment	Teachi St	ng-Learning trategy	MQF LO Domain				
	Strategy	Kuliah		Penilaian kelas, per kemahirai pembenta	penyertaan nilaian n, angan	Knowledge		
		Pembelaja dan kolab	aran koperatif oratif	Penilaian kelas, per kemahirai pembenta	penyertaan nilaian n, angan	Communication, Leadership and Team Skills		
		Penyelesa berdasark kerja	aian masalah an kertas	Penilaian	kemahiran	Information Management and Lifelong Learning Skills		
12.	Synopsis	Kursus ini sesuai de dalam kor untuk mer berkomun kreatif.	i membolehkan p ngan intelek pela nteks rasmi, krea mpertingkat kece ikasi dengan lisa	belajar mem ajar untuk b atif dan buka ekapan berb an dan tulis	npertingkatkan ke erkomunikasi se an kreatif. Mata p pahasa sesuai de an dalam kontek	ecekapan berbahasa cara lisan dan tulisan pelajaran ini disediakan engan intelek pelajar untuk s rasmi, kreatif dan bukan		
13.	Mode of Delivery	Projek-pe	nyelesaian masa	ooratif				
14.	Assessment		Asse	ssment		%		
	Methous and Types	Peperiksa	an Akhir			30		
		Penilaian	Berterusan			70		
				Continuo	us Assessment	t		
		CLO	Teaching- Strate	learning egy	Assessment	%		
		1, 2, 3	Pembelajara koperatif da kolaboratif	an n	Penilaian kemahiran	20%		
		1, 2, 3	Pembelajara koperatif da kolaboratif	an n	Pembentang an	30%		
		1, 2, 3	Penyelesaia masalah be kertas kerja	an rdasarkan	Penilaian Penyertaan	20%		
15.	Mapping of the	The obje	ctives of the pro	ogramme a	ire:			
	Course to the Programme Aims	PEO 1	Graduates will l engineering fiel with appropriate	be employe d with good e attitude er	d or self-employe I level of knowled nabling them to h	ed in relevant software lge and competency skills ave successful career		
		PEO 2	Graduates will a collaborative we through profess	acquire abil orking in div sional involv	ities for effective verse teams, and vement	communication, continual development		

		PEO 3	Gr ad pr	raduate Ivancer ofessio	es will pur ment of ir ns and re	rsue lifelo formatic elated co	ong lear on techn ntempc	rning in o lology an orary issu	rder to d com es	contrib puter so	oute to t cience	he		
		Course	9		I	Program	nme Ed	ucationa	l Obje	ctives				
		Learnin	g es		PEO 1			PEO 2			PEO 3			
		CLO 1			2									
		CLO 2						3						
		CLO 3									2			
		Note: 1 = L	ittle (Contribu	tion; 2 = Mo	oderate Co	ontributio	n; 3 = Stron	g Contr	ibution				
16.	Mapping of the Course to the	The lear	ning outcomes of the programme are:											
	Programme Learning	PLO 1	Ap pri	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering										
	Outcomes	PLO 2	Ap	oply the	eoretical p	orinciples	s of Sof	tware Eng	gineeri	ing in re	elevanta	areas		
		PLO 3	De pro im lar	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system										
		PLO 4	Us thi	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving										
		PLO 5	Co etl	Conduct professional and ethical responsibilities in accordance with ethical and legal principles										
		PLO 6	Fu of	Function effectively both as individuals and in a group in the capacity of a leader or a team member										
		PLO 7	Ap de pra	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice								ring		
		PLO 8	Co co	ommun ommuni	icate effe ty and wi	ectively w th the so	/ith the ociety at	software large	syster	n devel	opment			
		PLO 9	Ap ca	oply ski Ireer de	lls and pr evelopme	rinciples nt	of lifelo	ng learnir	ng in b	oth aca	idemic a	and		
		Course				Progra	imme L	earning	Outco	omes	-	-		
		Learnin Outcom	g es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9		
		CLO 1		3										
		CLO 2							3					
		CLO 3										1		
		Note: 1 = L	ittle (Note: 1 = Little Contribution; 2 = Moderate Contribution; 3 = Strong Contribution										

oonten			Topic					
		Stud	lent Le	arning	Time (SLT)		
Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)	Assessment
1	 Pengenalan Dasar Bahasa Proses penentuan dasar bahasa Masalah perlaksanaannya 	2	-	-	-	3	5	Penilaiar penyertaa kelas, penila pensyaral persembah tugasan
2	 Pengenalan - cont. Fungsi Bahasa Melayu Bahasa kebangsaan Bahasa rasmi Bahasa perpaduan Bahasa ilmu 	2	-	-	-	3	5	Penilaiar penyertaa kelas, penila pensyaral persembah tugasan
3	 Pengenalan - cont. Kedudukan dan Taraf Bahasa Melayu Perkara 152 Perlembagaan Persekutuan Akta Bahasa Kebangsaan Akta Pendidikan 	2	-	-	-	3	5	Penilaiar penyertaa kelas, penila pensyaral persembah tugasan
4	 Sistem Ejaan dan Sebutan Baku - cont. Sistem Ejaan Bahasa Melayu Bunyi dan huruf Pola kelarasan vokal Kekecualian sistem keselaran vokal Ejaan kata pinjaman Penulisan kata sendi nama 	2	-	-	-	3	5	Penilaiar penyertaa kelas, penila pensyaral persembah tugasan

5	 Sistem Ejaan dan Sebutan Baku - cont. Sistem Ejaan Bahasa Melayu Penulisan kata ganti nama singkat Penulisan partikel Penulisan kata berimbuhan Penulisan kata ganda Penulisan kata majmuk dan rangkai kata 	2	-			3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
6	 2. Sistem Ejaan dan Sebutan Baku - cont. Sebutan Baku Bahasa Melayu Prinsip sebutan baku Vokal, Konsonan dan diftong Penyukuan 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
7	 2. Sistem Ejaan dan Sebutan Baku - cont. Intonasi Sistem Ejaan dan Peristilahan Aspek Dinamika dan Apresiasi Bahasa 	2	-	-	Π	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
8	 3. Membaca dan Memahami Bahan prosa Bahan puisi 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
9	 3. Membaca dan Memahami - cont. Komunikasi di khalayak Ucapan Syarahan Temuramah Pengacaraan majlis 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
10	 3. Membaca dan Memahami - cont. Taklimat Pidato Forum Bahas Pengendalian mesyuarat Ulasan dan komentar 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan

	11	 4. Penulisan Ciri-ciri penulisan 							Penilaian penyertaan
		FaktaGaya dan larasPengolahanBahasa	2	-	-	-	3	5	kelas, penilaian pensyarah, persembahan tugasan
	12	 4. Penulisan - cont. Jenis-jenis teks Surat rasmi Laporan Minit mesyuarat 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
	13	 4. Penulisan - cont. Minit mesyuarat Pengumuman Rencana Ucapan 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
	14	 4. Penulisan - cont. Wawancara Kertas kerja Kad ucapan Puisi Cerpen 	2	-	-	-	3	5	Penilaian penyertaan kelas, penilaian pensyarah, persembahan tugasan
	15	Revision	-	-	-	-	8	8	
	16-17	Examination	-	-	-	2	-	2	
		Total	28	-	-	2	50	80	
		Notional hours			4	0			
		Credit value				2			
18.	Main re	ferences supporting the course:	1						1

- Nik Safiah Karim, Farid M. Onn, Abdul Hamid Mahmood dan Hashim Musa. 2000. Tatabahasa Dewan (Edisi Baharu). Kuala Lumpur : Dewan Bahasa dan Pustaka.
- Kamarudin Hj. Husin & Siti Hajar Hj. Abdul Aziz. 1999. Bahasa Kebangsaan (A). Kuala Lumpur : Kumpulan Budiman Sdn. Bhd

Additional references supporting the course:

- Ab. Rahman Ab. Rashid dan Hjh. Wan Som, 1995, Bahasa Melayu dalam komunikasi, Petaling Jaya: Longman Malaysia.
- Ab. Rahman Ab. Rashid dan Yap Kim Fatt, 1995, Bahasa Melayu-Komunikasi Berkesan dan Perdagangan Umum. Petaling Jaya: Longman Malaysia.
- Abdullah Hassan, 1980, Linguistik Am untuk Bahasa Malaysia, Petaling Jaya: Fajar Bakti Sdn. Bhd.
- Asmah Hj Omar, 1980, Language and Society in Malaysia, Kuala Lumpur: Dewan Bahasa & Pustaka.

1.	Name of course:	IT Proje	Project Management								
2.	Code of course:	CSS345	3								
3.	Synopsis:	To provi modellin how a pr process.	de students with the fundamental knowledge, skills and experience on g, planning, organizing, scheduling, and budgeting of an IT project and oject can be aligned to provide value to an organizations' work or business								
4.	Name(s) of academic staff:	Marcella	Peter								
5.	Semester and year of offered	Semeste	Semester 1 Year 3								
6.	Credit value:	3	3								
7.	Prerequisite/co- requisite (if any):	Success	Successful completion of CSS3413 Introduction to Software Engineering								
8.	Learning	Program	Programme Educational Objectives (PEO):								
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.								
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.								
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.								
		<u>Program</u> Upon co	me Learning Outcomes (PLO): mpletion of the program, the graduates should be able to:								
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and								
		PLO2	Apply theoretical principles of computer science in relevant areas, and								
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and								
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and								
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and								
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and								
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and								
		PLO8	Communicate effectively with the computing development community and with the society at large, and								
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.								
		Course I Upon co	Learning Outcomes (CLO): mpletion of the course, the students should be able to:								

	CLO1 Analyze and model a busines IT implementation and manage									siness ianage	or wo ment	rk process (PLO7, C2)	in a	context su	itable for
				CLO2	2 In so	npleme chedul	ent as e, and	s a I bud	team get (P	the v LO6, C	arious 3)	s stages of	f pr	oject plan	, scope,
				CLO3	B Ui in	nderst tegrate	and ir ed app	nport proac	ant co h to IT	oncepts F proje	s and ct mai	methodolog nagement (l	gies PLO	associateo 3, C2)	l with an
9.	Mapping of Methods a	of the nd As	Cour	se Lea ment:	arning	y Outo	comes	s to t	the Pi	rogran	nming	g Learning	Out	tcomes, T	eaching
	Course		P	rogram	me Lea	rning C	Dutcom	ies (Pl	_0)		_				
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO8	B PLO9	Tea	aching Metho	ds	Assess	ment
	CLO1							1			Prac Com Lear	ure, ruto tical, Assignm puter-based ning	ent,	Quiz, Ass Project, Te Examination	ignment, st, Final n
	CLO2						3				Lecto Prac Com Lear	ure, Tuto tical, Assignm puter-based ning	orial, ent,	Quiz, Ass Project, Te Examination	ignment, st, Final n
	CLO3			3							Lector Prac Com Lear	ure, Tuto tical, Assignm puter-based ning	orial, ent,	Quiz, Ass Project, Fin	ignment, al Exam
10	Transferable skills (if applicable): Communication				ation, nt and	Emoti Entre	onal pren	Intelli eurial	gence, Skills.	, Lea	dership and	d Te	eam Skills	, Quality	
11	Distributio	n of S	tudo	ntloa	rning	Timo	(SI T)								
	Distribution of Student Learning Time (SLT):														
	Co	urse Co	ntent (Outline		CI	۰ —	Guid	ed Lea	rning (F	2F)	Guided	Inc	dependent	Total
						-		L	т	Р	0	Learning (NF2F)	I	Learning (NF2F)	SLT
	 The Nature Introduction Project Ling Developm Project Mission 	re of Information on ife Cyclonent anagem	ormati e (PLC	ion Tech c) and S dy of Kn	nnology Software owledge	/ e 3	5	2	2			1		1	6
	 2. Project C An Infor Methodole Business Project Se 	oncept mation ogy Case election	ualisin Tech and Ap	g nology oproval	Projec	t 1		2	2			1		1	6
	3. Process I • Business (BPMN) • Branching • Process I	 Project Selection and Approval 3. Process Modelling 1 Business Process Model and Notation (BPMN) Branching and Merging Process Decomposition 				ו 1		2		2				2	6
	 Process Decomposition 4. Process Modelling 2 Process Reuse Reword and Repetition Handling Events and Exceptions Processes and Business Rules 				1		2		2				2	6	
	 5. Process Analysis Qualitative Process Analysis Quantitative Process Analysis 				1		2	2					2	6	
	Quantitative Process Analysis G. Developing the Project Charter and Baseline Project Plan Project Management Processes Project Integration Management The Project Charter The Project Planning Framework The Kick-Off Meeting				2,	3	2	1	1				2	6	

	7. Defining and Managing Project Scope Initiation Project Scope Definition Project Scope Verificatio Scope Control Change	g Project Scope and Planning on	2	2	1	1			2	6
	 8. The Work Breakdown Project Estimation The Work Breakdown S Project Estimation Software Engineering Approaches 	a Structure and tructure (WBS) Metrics and	2, 3	2	1	1			2	6
	 9. Project Schedule and Developing the Project S Project Management So Developing the Project B 	Budget Schedule oftware Tools Budget	2, 3	2	1	1			2	6
	 10. Project Risk Manager IT Project Risk Manager Process Risk Analysis, Assessm Risk Monitoring and Context Risk Response and Evaluation 	2, 3	2	2				2	6	
	 11. Human Side of Project Organization and Project Project Team Leadership and ethics Project Environment 	3	2	2			1	1	6	
	 12. Project Change Mana The Nature of Change The Change Manageme Dealing with Resistance 	3	2	2			1	1	6	
	 13. Quality Management The Quality Movement Quality Systems The IT Project Quality P 	2, 3	2	2			1	1	6	
	 14. Project Implementation Project Implementation Administrative Closure Project Evaluation 	on, Closure and	2, 3	2	2			1	1	6
		Tot	tal (SLT)	28	20	8		6	22	84
	Continuous	Assessment					Percent	age (%)		Total SLT
	1. Quiz						1	0		2
	2. Assignment						1	5		8
	3. Project						2	5		11
	4. lest						1	U		5
	Final Ass	sessment					Percent	age (%)		SLT
	Final Examination						4	0		10
		Tot	tal (SLT)				10	0%		36
	L = Lecture, T = Tutorial, P =	= Practical, O = Ot	hers, F2F	= Face	to Face.	NF2F =	Non Fa	GRA ice to Face	ND TOTAL SLT	120
12	Identify special requirement or resources to deliver the course:	nd Signa	avio Bl	PM too	ls					
13	References:	<u>ces:</u> ka, J. (20 measura	016). li able oi	nforma rganiza	ation te ational	chnolo value.	gy project r John Wiley	management: v. ISBN: 978-1-	118-	

		 Dumas, M. (2018). Fundamentals of business process management. Springer. ISBN: 978-3-642-33143-5 <u>Additional references:</u> Larson, E. (2017). Project Management. McGraw-Hill. ISBN-13: 978- 										
14	Other additional information:	1259666094 None										

1.	Name of course:	Mobile	Application Development									
2.	Code of course:	CSS33	44									
3.	Synopsis:	This co mobile applica	urse provides the students with advanced knowledge and practical skill of application development, so that the students are able to develop mobile tion and to solve the problem of an organization.									
4.	Name(s) of academic staff:	Anli Sh	erine									
5.	Semester and year of offered	Semes	ter 1, Year 3									
6.	Credit value:	4										
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3133 Object Oriented Programming									
8.	Learning	Program	mme Educational Objectives (PEO):									
	outcomes:	PEO1	PEO1 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.									
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.									
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.									
		Program Upon c	<u>nme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:									
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science									
		PLO2	Apply theoretical principles of computer science in relevant areas									
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution									
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving									
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles									
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member									
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice									
		PLO8	Communicate effectively with the computing development community and with the society at large									
		PLO9	PLO9 Apply skills and principles of lifelong learning in both academic and career development.									
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:									

				CLO1	Exp Fra	olain I mewo	Nobile rk (PL	, We O1, C	b, De 2)	sktop	design	and Andr	oid's programming		
				CLO2	App (P	oly Jav LO3, (va proę C3)	gramm	ning co	oncept	s to Andro	oid applica	ation development.		
				CLO3	Dev C6)	elop a	a mob	ile app	olicatio	on usir	ng various	current to	echnologies (PLO4,		
9.	Mapping of the Course Learning Outcomes to the Programming Learning Outcomes, Teaching Methods and Assessment: Course Programme Learning Outcomes (PLO)														
	Loarning		r 	rogram	me Lea	arning C	Jutcom	les (PL	0)						
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	Teaching	Methods	Assessment		
	CLO1	3									Lecture, practical	Tutorial,	Progress Test, Assignment Final Examination		
	CLO2			3							Lecture, Practical	Tutorial,	Progress test, Assignment Final Examination		
	CLO3				3 Practical Assignment										
	Note: 1 = Lit	tle Con	tributio	n; 2 = Ma	oderate	Contrib	oution; 3	8 = Stror	ng Cont	ribution					
10.	Transferat	ransferable skills f applicable):													

11.	I. Distribution of Student Learning Time (SLT):												
				Т	eaching) and L	earning Activiti	ies					
	Course Content Outline	CLO	Guio	led Lea	rning (F	F2F)	Guided	Independent	Total				
			L	т	Р	ο	Learning (NF2F)	Learning (NF2F)	311				
	 Introduction to Mobile Devices Mobile Devices vs Desktop Devices Power management Screen Resolution Touch Interfaces Application Deployment Native vs Web Applications Android Development Environment 	1,2	2	1				3	6				
	 2. Developing Mobile Applications Mobile Software Engineering Frameworks and Tools Generic UI Development Android User. 	1,2	2	1				3	6				
	 3. Designing User Interface VUIs and Mobile Apps Components of a Screen Adapting to Display Orientation Managing changes to Screen Orientation Listening for UI Notifications 	1,2,3	2		3			5	10				
	 4. Designing User Interface - Cont. Listening for UI Notification Using Basic Views Using Picker views Using List views Understanding Specialized Fragments Applying a Theme 	1,2,3	2		3			5	10				
	 5. Application Development Android Activities Android APIs Linking Activities using Intent 	1,2,3	2		3			5	10				
	 6. Application Development -cont. Fragments Notifications 	1,2,3	2		3			5	10				

	 7. Application Developme Synchronization and Mobile Data Android storing and Re Using Content Provide 8. Application Developme Mobile Agents ar 	nt -cont. I Replication of etrieving Data er nt – cont. nd Peer-to-Peer	1,2,3	2		3			5	10		
	Architecture •Android Multimedia		1,2,3	2		3			5	10		
	 9. Application Developme Mobility Location Based Service 	nt – cont. æs	1,2,3	2		3			5	10		
	10. Application DevelopmPackaging and PublishDeploying APK files	ent – cont. ning	1,2,3	2		3			5	10		
	11. Communications • State Machine • Communications Mode • Android Networking ar	el nd Web	1,2,3	2		3			5	10		
	12. Mobile Device Securit • Mobile Malware • Active Transactions	1,2,3	2	2				4	8			
	13. Mobile Device SecuritDevice ProtectionData Privacy	1,2,3	2	2				4	8			
	14. Mobile Device Applica • Augmented Reality	1,2,3	2	2				4	8			
		Tot	tal (SLT)	28	8	27	-	-	63	126		
	Continues	Assessment		Percentage (%)								
	1. Progress Test							20		4		
	2. Assignment							40		18		
	Final As	sessment			SLT							
	1. Final Examination	Та		40								
		100										
	L = Lecture, T = Tutorial, P	= Practical, O = O	thers, F2F	= Face	e to Face	e, NF2F	= Non	Face to Face				
12.	Identify special requirement or resources to deliver the course:	Android Stud	io									
13.	References:	 <u>Main references:</u> Philips B & Hardy (2019). Android programming: the Big Nerd Ranch guide. Atlanta, GA: Big Nerd Ranch . ISBN : 9780136590071 Jakob Iverson, Michael Eierman (2018) Mobile App Development for ios & Android. Pearson Education. ISBN: 9781984616661 <u>Additional references:</u> DiMarzio, J.F. (2017) Beginning Android Programming with Android Studio. Indianapolis, IN: John Wiley &sons, ISBN: 9781118705599 John, Horton (2018). Android programming for Beginners: Build in depth, full featured Android 9 pie apps starting from zero programming experience. Packt Publishing. ISBN: 9781789538502 										
		Atlanta, Jakob Iv Android. <u>Additional ref</u> DiMarzio Indianap John, Ho featured Packt Po	ierences o,J.F.(20 polis, IN: orton (20 Android ublishing	Michae n Educ 117) B John 018). A d 9 pin J. ISBN	eginni Wiley Ndroic e app 1: 978	ng And ksons progr s start 17895	droid , ISBN ammi ammi 38502	Nobile App 984616661 Programming 984616661 Programming 978111870 ng for Beginr om zero pro	Development g with Androi 05599 ners: Build in o gramming ex	for ios & d Studio. depth, full perience.		

1.	Name of course:	Final Y	Final Year Project I										
2.	Code of course:	CSS37	14										
3.	Synopsis:	In the worksh literatur data. La for rese II. Stud topic, o of the re require	beginning of the course, students are required to attend a research op where they will be taught on how to execute a research, conduct re review, decide appropriate methodology, collect, interpret and analyse ater, students will be guided by the respective supervisors on how to plan earch which will be conducted later in the course entitled Final Year Project ents will carry out weekly discussion with their supervisor on the research bjective, scope, research programme, and the extent of the development esearch proposal. A report and a presentation of the research proposal are d at the end of the course.										
4.	Name(s) of academic staff:	Appointed Supervising Lecturer											
5.	Semester and year of offered	Semes	Semester 1, Year 3										
6.	Credit value:	4	4										
7.	Prerequisite/co- requisite (if any):	None											
8.	Learning	Program	mme Educational Objectives (PEO):										
	outcomes:	PEO1	PEO1 Graduates will be employed or self-employed in relevant compu science field with good level of knowledge and competency skills w appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		<u>Progran</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6 Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7 Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8 Communicate effectively with the computing development community and with the society at large, and											

				PLO9	App dev	oly skil elopm	ls and ient.	prin	ciples	s of li	felon	ng le	earning in both	n academic a	nd career	
				<u>Cours</u> Upon	e Leai compl	rning (etion (<u>Dutco</u> of the	mes cour	<u>(CLC</u> se, th) <u>:</u> ne stu	uden	its s	should be able	e to:		
				CLO1	Ack of s	nowle elf-up	edge th gradin	ne co ig (A	ontinu 1, PL	ious .O9)	deve	elop	ment of know	ledge and th	e needs	
				CLO2	Def	ine the	e obje	ctive	s of a	a res	earcl	h (C	C1, PLO2)			
				CLO3	Cor	nduct i	review	s on	prev	ious	rese	earc	h (C6, PLO4)			
				CLO4	Pro PLC	pose i D3)	metho	dolo	gy to	colle	ect da	ata	for conducting	g research (C	6,	
				CLO5	Pla	n the s	sched	ule o	of a re	sear	ch (C	C6,	PLO7)			
				CLO6	Pro	duce a	a rese	arch	prop	osal	(C3,	PL	.08)			
9.	Mapping o	of the	Cour	se Lea	arning	Outo	comes	s to	the F	Prog	ramr	min	g Learning (Outcomes, T	Feaching	
	Course		F	rogram	me Lea	rning (Dutcom	nes (F	PLO)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	7 PL	08 F	PLO9	Te	eaching Method	s Assess	sment	
	CLO1										3	Le Su Pro Le	cture, Proje pervision, oblem-based arning	ct Supervisor Evaluation, Report	Written	
	CLO2		1									Le Su Pro Le	ture, Project Supervisor pervision, Evaluation, Writte blem-based Report, Presentation rrning			
	CLO3				3							Le Su Pro Le	cture, Proje pervision, oblem-based arning	Project Supervisor Evaluation, Writter ed Report, Presentation		
	CLO4			3								Le Su Pro Le	cture, Proje pervision, oblem-based arning	ct Supervisor Evaluation, Report, Pre	Written esentation	
	CLO5							1				Le Su Pro Le	cture, Proje pervision, oblem-based arning	ct Supervisor Evaluation, Report	Written	
	CLO6								3	3		Le Su Pro Le	cture, Proje pervision, oblem-based arning	ct Supervisor Evaluation, Report	Written	
	Note: 1 = Lit	tle Con	tributio	n; 2 = M	oderate	Contrib	oution; 3	B = St	rong C	ontrib	ution		0			
10.	Transferat (if applicat	Ible skills Knowledge; Practical Skills; Problem Solving and Scientific Skills; Managerial and Entrepreneurial Skills; Social Skills and Responsibilities; Information Management and Lifelong Learning Skills.									gerial and nagement					
11.	Distributio	tion of Student Learning Time (SLT):														
				0				Guid	T	eachi	ng ar	nd L	earning Activitie	es Independent	Total	
	Co	urse Co	ontent	Outline		CL	_0	L	T	P		, o	Learning (NF2F)	Learning (NF2F)	SLT	
	 How to do research Definitions, Concepts and Characteristics of research Intelligence gathering – the what question Research – the why question Stages of research Characteristic of good research Basic types of research – exploratory 					¹ 1,2	2						2	4	6	

research, testing out research, and problem solving research • Research aims – students, supervisors, Examiners, universities and research councils' aim						
 2. Research Methodology Problem identification and classification Identifying research statement Defining the scope and objective of research Research design and methodology Getting information Knowledge formulation Project planning Experimental programme 	1,2			2	4	6
 3. Conducting Literature Review Source of literature review Tools of information search – Library, Internet, CD-rom, etc Types of reference – journal papers, proceedings, technical notes, internal reports, postal, books, standards, guides etc Citing a publication Ethic, Plagiarism 	3			2	4	6
 4. Data Sampling, Collection, Analysis and Interpretation Sampling of data – size, random and non- random sampling Data collection methodology and techniques Statistical analysis and interpretation of data Data analysis – numerical, analytical, experimental, case study, computer simulation, etc Verification and justification results 	4			3	6	9
 5. Research Proposal Preparation Assigning students with respective supervisors Identifying research proposal 	5			3	6	9
 5. Research Proposal Preparation - cont. Conducting literature review Discussion with supervisor Preparation of research proposal report Preparation of proposal presentation 	3,4,6			3	6	9
 5. Research Proposal Preparation - cont. Conducting literature review Discussion with supervisor Preparation of research proposal report Preparation of proposal presentation 	3,4,6			3	6	9
 5. Research Proposal Preparation - cont. Conducting literature review Discussion with supervisor Preparation of research proposal report Preparation of proposal presentation 	3,4,6			3	6	9
 5. Research Proposal Preparation - cont. Conducting literature review Discussion with supervisor Preparation of research proposal report Preparation of proposal presentation 	3,4,6			3	6	9
 5. Research Proposal Preparation - cont. Conducting literature review Discussion with supervisor Preparation of research proposal report Preparation of proposal presentation 	3,4,6			3	6	9
 Research Proposal Preparation - cont. Conducting literature review 	3,4,6			3	6	9

	 Discussion with supervis Preparation of research Preparation of proposal 											
	5. Research Proposal Pre • Conducting literature rev • Discussion with supervis • Preparation of research • Preparation of proposal	paration - cont. view sor proposal report presentation	3,4,6					3	6	9		
	 5. Research Proposal Pre Conducting literature rev Discussion with supervis Preparation of research Preparation of proposal 	paration - cont. view sor proposal report presentation	3,4,6					3	6	9		
	6.Proposal Submission ar					1			1			
		I (SLT)	-	-	-	1	36	72	109			
										Tatal		
	Continues					Percer	ntage (%)		SLT			
	1.Supervisor Evaluation						25		7			
	2. Presentation						25		4			
	Final As					Percer	ntage (%)		Total SLT			
	1. Written Report			40								
		I (SLT)		51								
								GRAN	ID TOTAL SLT	160		
	L = Lecture, T = Tutorial, P	= Practical, O = Oth	ners, F2F	= Face	e to Fac	e, NF2F	= Non	Face to Face				
12.	Identify special requirement or resources to deliver the course:	None										
13.	deliver the course: Image: References: Main references: • Crewell, J. D. & Creswell, J. W. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 5th Edition. SAGE Publications Inc. ISBN: 9781506386768 • Pyrczak, F. & Bruce, R. (2017). Writing Empirical Research Reports: a Basic Guide for Students of the Social and Behavioral Sciences, 8th Edition. London: Routledge. ISBN: 9781936523368 Additional references: • Lester, J. (2018). Writing research papers: a complete guide, 16 TH Edition Pearson. ISBN: 9780134519029 • Kumar, R. (2019). Research methodology: a step-by-step guide fo beginners, 5 th Edition. SAGE Publications. ISBN: 9781526449900 • Flick, U. (2015). Introducing research methodology: a beginner's guide to doing a research project, 2 nd Edition. SAGE Publications. ISBN											
14.	Other additional		14. Other additional information: None									

1.	Course Name	Entrepr	eneurship	o Skills										
2.	Course Code	MPU32	12											
3.	Academic Staff Name(s)	Jemie I	Menchol											
4.	Rationale for the inclusion of the Course in the Programme	This co begin a	urse is to venture.	acquire k	nowledge	and develop sk	ills necessary to plan and							
5.	Semester and Year Offered	Semes	ter 1, Yea	r 3										
6.	Total Student Learning Time (SLT)		Face to Face (F2F) Non Contact (Non F2F) Total Guided and Independent learning											
	L = Lecture T = Tutorial P = Practical O = Others	L 28	L T P O 28 0 0 0 ⁵² 80											
7.	Credit Value	2												
8.	Prerequisite (if any)	None												
9.	Course Learning	Upon completion of this course, students should be able to:												
	Outcomes (CLOS)	CLO1	Underst PLO1)	and the c	haracteris	tics of a succes	sful entrepreneur (C2,							
		CLO2	Explain (C2, PL0	and apply O7)	/ the com	ponents of an er	ntrepreneurial business plan							
		CLO3	Prepare busines	in the a s support	pplying o system a	f management nd in setting up	and entrepreneurial skills in a business entity (C6, PLO9)							
10.	Transferable Skills		Skills		Dev N	elopment lethods	Assessment Methods							
		Knowle	dge		Lecture,	Discussion	Assignment, Quiz, Final examination							
		Information Group activity Assignment Management and Lifelong Learning Skills												
		Manage Entrepr	erial and reneurial S	Skills	Group a	ctivity	Assignment							
11.	Teaching-learning and Assessment	Теас	hing-Lea Strategy	rning	Ass S	Assessment MQF LO Domain Strategy								
	Strategy	Lecture Assignment, Quiz, Final Examination Knowledge												

		Discussion		Assignme Final Exa	ent, Quiz, mination	Knowledge					
		Group Activ	vity	Assignme	ent	Information Management and Lifelong Learning Skills					
						Managerial and Entrepreneurial Skills					
12.	Synopsis	This course also provides an understanding of an individual as entrepreneur and the process of creating and growing a new venture. The topics include theory of entrepreneurship, types of entrepreneurship, the importance of entrepreneurship and factors affecting entrepreneurship, entrepreneurship develop in Malaysia entrepreneurial creativity and innovation, opportunity identification, business plan business support system and form of business entities and relate lega requirements.									
13.	Mode of Delivery	Lecture, Dis	scussion, Grou	p Activity							
14.	Assessment		Asse	ssment			%				
	Methous and Types	Final Exam	ination				50				
		Continuous	Continuous Assessment 5								
		Continuous Assessment									
		CLO	Teaching- Strate	learning egy	Assessment	t	%				
		1, 2	Lecture		Progress Test / Quiz	t	10				
		2, 3	Assignment		Assignment		30				
		1, 2, 3	Assignment		Presentation - Q&A evaluation	+	10				
15.	Mapping of the	The object	tives of the pro	ogramme a	are:						
	Course to the Programme Aims	PEO 1 C	Graduates will engineering fiel with appropriate	be employ d with good e attitude er	ved or self-emp d level of knowle nabling them to	oloyed edge a have s	in relevant software nd competency skills uccessful career				
		PEO 2 C	Graduates wil collaborative w through profess	ll acquire orking in d sional involv	abilities for liverse teams, a vement	effect and co	ive communication, ontinual development				
		PEO 3 C a F	Graduates will advancement professions and	pursue life of informa d related co	long learning ir ition technolog ntemporary issu	n order y and les	to contribute to the computer science				
		Course		Program	me Educationa	al Obje	ectives				
		Outcomes	PEC	01	PEO 2	PEO 3					

		CLO 1			3								
		CLO 2						2					
		CLO 3									3		
		Note: 1 = L	ittle	Contribu	tion; 2 = Me	oderate Co	ontributio	n; 3 = Str	ong Conti	ribution			
16.	Mapping of the	The lear	ning	g outco	omes of	the prog	Iramme	e are:					
	Programme Learning	PLO 1	Ар pr	oply kn inciples	iowledge s, skills, a	and ur ind theor	nderstar ies rela	nding o iting to \$	f esser Software	ntial fac e Engine	ts, con eering	cepts,	
	Outcomes	PLO 2	Ap	oply the	eoretical p	orinciples	s of Sof	tware E	ngineer	ing in re	elevant a	areas	
		PLO 3	De pr im lai	emonst ovide iplemer rge-sca	rate app a basis ntation, e ile softwa	ropriate for ar evaluatio ire syste	metho nalysis, n, mair m	dologie desig ntenanc	s, mod n, deve e, and	els, teo elopmer docum	chniques nt, test entation	s that and of a	
		PLO 4	Us th	se rele inking s	evant teo skills in pi	hniques roblem s	and o olving	demons	trate a	nalytical	and	critical	
		PLO 5	Co et	onduct hical ar	profession nd legal p	onal and principles	ethical	respor	sibilitie	s in acc	ccordance with		
		PLO 6	Function effectively both as individuals and in a group in the capacity of a leader or a team member										
		PLO 7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to software engineering practice										
		PLO 8	Co co	ommun ommuni	icate eff ty and wi	ectively th the sc	with t ciety a	he sof t large	tware s	system	develo	oment	
		PLO 9	Ap ca	oply ski areer de	ills and p evelopme	orinciples nt	s of life	long lea	irning ir	ı both a	academi	c and	
		0				Progra	imme L	earnin	g Outco	omes			
		Learnin Outcom	es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	
		CLO 1		3									
		CLO 2								2			
		CLO 3		2									
		Note: 1 = L	ittle Contribution; 2 = Moderate Contribution; 3 = Strong Contribution										

Content Outline of the Course and the SLT per Topic											
		Stud	lent Le	arning	Time (SLT)					
Week	Course Materials	Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)	Assessment			
1	 1. Introduction to Entrepreneurship Theories of Entrepreneurship Entrepreneurship versus entrepreneur 	2	-	-	-	2	4	Progress Tes Final Examinatior			
2	 2. Competencies of entrepreneurship Introduction Entrepreneurial competencies Importance of entrepreneurship and factors affecting entrepreneurship 	2	-	-	-	4	6	Progress Tes Final Examinatior			
3	 3. Entrepreneurship development in Malaysia Pre-independence: The influence of British Colonisation Post-independence: Achievements and issues 	2	-	-	-	4	6	Progress Tes Assignment Final Examinatior			
4	 3. Entrepreneurship development in Malaysia - cont. The New Economic Policy (NEP) The New Economic Model (NEM) 	2	-	-	-	3	5	Progress Tes Assignment Final Examinatior			
5	 4. Opportunity identification Scanning the environment Screening, analysis and selection of the opportunities 	2	-	-	-	3	5	Progress Tes Assignment Final Examinatior			

6	 4. Opportunity identification - cont. Long range strategic planning for small business Creating a viable business model to capture an opportunity 	2	-	-	-	3	5	Progress Test, Assignment, Final Examination
7	 5. Management of Small Business Human Resource Management 	2	-	-	-	3	5	Assignment, Final Examination
8	 5. Management of Small Business - cont. Marketing Management 	2	-	-	-	3	5	Assignment, Final Examination
9	 5. Management of Small Business - cont. Operations management 	2	-	-	-	3	5	Assignment, Final Examination
10	 6. Business plan Purpose of preparing a business plan Project preliminary screening 	2	-	-	-	3	5	Assignment, Final Examination
11	 6. Business plan - cont. Business plan format Social entrepreneurship project 	2	-	-	-	3	5	Assignment, Final Examination
12	 7. Business support system The importance of business support systems Forms of business support systems 	2	-	-	-	3	5	Assignment, Final Examination
13	 7. Business support system - cont. Financial support systems Capacity and capability enhancement services 	2	-	-	-	3	5	Assignment, Final Examination

	14	 8. Form of business entities and relate legal requirements Forms of business & entities Business legal requirements 	2	-	-	-	4	6	Assignment, Final Examination	
	15	Revision	-	-	-	-	6	6		
	16-17	Examination	-	-	-	2	-	2		
		Total	28	-	-	2	50	80		
		Notional hours								
		Credit value			2	2				
18.	 Main references supporting the course: Sodri Arifin, Ismail Ab. Wahab & Zarida Hambali (2013). Fundamentals of Entrepreneurship. Oxford Fajar Sdn Bhd. 									

Additional references supporting the course:

• Sarimah Hanin Aman Shah & Soon, C. T. L. (2013). Entrepreneurship (3th ed.). Oxford Fajar Sdn Bhd.

1.	Name of course:	Networ	letwork Administration and Network Management										
2.	Code of course:	CSS35	43										
3.	Synopsis:	To prov system networl	vide students with necessary skills to administer and manage a network . Students will also need to know proper planning of setting up a suitable k in different environment.										
4.	Name(s) of academic staff:	Khairur	nnisa Ibrahim										
5.	Semester and year of offered	Semes	Semester 2, Year 3										
6.	Credit value:	3	i										
7.	Prerequisite/co- requisite (if any):	Succes	Successful completion of CSS3513 Data Communication and Networking										
8.	Learning	Program	mme Educational Objectives (PEO):										
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		Prograi Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.										
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:										

				CLO1	Der leve	nonsti I relat	rate th ted set	e abil rvices	ty to (C3,	mana PLO	age a 1)	nd administra	te system an	d network	
				CLO2	Des and	ign as netw	s a tea ork lev	im in vel rela	deplo ated s	ying, servic	man es ai	aging and adr nd programmi	ministrating th ng (C6, PLO6	ne system 6)	
				CLO3	App (C3	ly adr , PLO	ninistr 7)	ation	and r	nana	geme	ent skills in va	rious busines	s settings	
				CLO4	Rec	ogniz	e the o	code (of cor	nduct	in pe	erforming task	(C2, PLO5)		
9.	Mapping o	of the	Cou	se Lea	arning	Outo	comes	to th	ne Pr	ogra	mmiı	ng Learning	Outcomes,	Feaching	
	Course			Program	me Lea	rning (Dutcom	es (PL	0)	_					
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	PLO	₉ Т	eaching Method	ls Asses	Assessment	
	CLO1	3										Lecture, Practica	Progres I Assigr Final Exa	Progress Test, Assignment Final Examination	
	CLO2						2					Practical	Assigr Prac	ment, tical	
	CLO3							2				Lecture, Practica	Progres I Assigr Final Exa	s Test, ment mination	
	CLO4					3						Lecture, Practica	Progres I Assign Final Exa	s Test, ment mination	
10.	Transferat	ole ski ole):	edge; eam S	Value kills; I	e, Attit Manag	udes erial a	and and E	Profe intrep	ssior rene	nalism; Comm urial Skills	nunication, Lo	eadership			
11.	Distribution of Student Learning Time (SLT):														
		-		.				Guided	Tea	aching ving (F	and I	Learning Activiti	es Independent	Total	
	Col	irse Co	ntent	Outline		CLO			T	P	0	Learning (NF2F)	Learning (NF2F)	SLT	
	1. Introductio Scope Challe Netwo Role a	on to Sy e, C enges ar ork Adm and IT S	stem A Goals, nd com inistrat	Administr Phil amon pra ors Compor	ation osophy actice nent	1,3	.4 :	2	2				2	6	
	 Role and IT System Component 2. System Components and Network Components Hardware in the system Operating Systems Filesystems Processes and job control Network Components Networks (IPv4 and IPv6) 					1,3,	.4 :	2		2			2	6	
	 Networks (IPv4 and IPv6) Host Management Physical consideration of server room Location, Access and Security of Data Centers Equipment in Data Centers (Power and Cooling, Fire Suppression, Racks, labelling, console access) Computer startup and shutdown Configuring and personalizing workstations Installation of Operating System Software Installation and Kernel customization 					1,3,	4 :	2		2			2	6	
	customization 4. Host Troubleshooting Comr symptoms • Unexpected shutdowns • System lockups • POST code beeps				ommon	1,3,	4	2	2				2	6	

 Blank screen on bootup BIOS time and setting resets Continuous reboots Overheating Loud noise Intermittent device failure Fans spin – no power to other devices Indicator lights Proprietary crash screens (BSOD/pin wheel) Log entries and error messages 							
 5. User Management Issues in user Management User registration Account policy Login environment Controlling user resource Ethical conduct of administration and users Computer Usage Policy 	1,3,4	2		2		2	6
 6. Models of network and system Administration Information Models and directory services System infrastructure and organization Network administration models and technologies System Maintenance Models Policy and Configuration automation 	1,3,4	2		2		2	6
 7. Application Level Service Proxies and agents Installing a new service Summoning deamons Setting up the DNS nameservices Print technologies (Laser, inkjet,Termal) 	1,3,4	2		2		2	6
 8. Productive and Business Software Word processing software Spreadsheet software Presentation software Web browser Conferencing software Visual diagramming software Database software Project management software Business-specific applications Accounting software 	1,3,4	2	2			2	6
 9. Email Services Privacy and Retention Policy Namespaces in Email Services Reliability and Simplicity of the services Spam and Virus Blocking Corporate and ISP email configuration (POP3, IMAP, port, ssl setting, S/MIME) Integrated commercial provider email configuration (iCloud, Google, Exchange, Yahoo) 	1,3,4	2		2		2	6
 10. Data Storage Technology in Data Storage Managing Storage (Monitoring and Performance) Local storage types (RAM, Hard drive, Solid state vs. spinning disk, Optical, Flash drive Local network storage types (NAS, File server) 	1,3,4	2	2			2	6

	Cloud storage service	Э								
	 Backup and Restore Reason for Restore Risk Analysis Damage Limitation Preparation Types of Restore (hotswappable) A Data Recovery SL/ Backup Schedule Time and Capacity P Backup Autom Centralization 	(RAID 0,1,5,10, A and Policy lanning ation and	1,3,4	2	2				2	6
	 12. Network Level Service The Internet Network Concepts Network Traffic and IP routing and forwar Multi-Protocol Lat (MPLS) Quality of Service (Q Cloud based appli application , desktop) 	1,2,4	2	2				2	6	
	 13. Security in con Management and Adminis Principles of security Physical security Security Policy Security tools (VPN, Intrusion detection ar Disaster Recovery (I Prioritization, restoring) 	nputer system tration IPSec, firewall, nd forensic Data restoration, g access)	1,2,4	2	2				2	6
	 14. Troubleshooting Methe Identify the problem Research knowledge if applicable Establish a theory of Test the theory to cause Establish a plan of a the problem and ic effects Implement the solution necessary Verify full system furn applicable, implem measures Document findings/le actions, and outcome 	1,2,4	2		2			2	6	
		Tot	al (SLT)	28	14	14			28	84
	Continues A	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test			L				10		4
	2. Assignment						_	30		20
	3. Presentation							10		2 Total
	Final Ass	essment					Percer	ntage (%)		SLT
	1. Final Examination						50		10	
		al (SLT)				10	00%		36	
	L = Lecture, T = Tutorial. P	thers, F2F	= Face	e to Face	e, NF2F	= Non	GRAN Face to Face	ID TOTAL SLT	120	
12.	Identify special requirement or resources to deliver the course:				·					

13.	References:	 <u>Main references supporting the course:</u> Gerardus Blokdyk, (2019) . Computer network Administration A Clear and Concise Reference. 5STARCooks. ISBN-13 : 978-0655534105 <u>Additional references supporting</u> Mike Meyers, (2019). CompTIA A+ Certification All-in-One Exam Guide, Tenth Edition (Exams 220-1001 & 220-1002). McGraw-Hill Education. ISBN-13: 9781260454031 Lowe, D. (2013). Networking all-in-one for dummies. Hoboken, N.J. Chichester: Wiley John Wiley distributor. ISBN-13: 978-1118380987 Bejtlich, R. (2013). The practice of network security monitoring: understanding incident detection and response. San Francisco: No Starch Press. ISBN-10: 1593275099
14.	Other additional information:	None

1.	Name of course:	Final Ye	nal Year Project II										
2.	Code of course:	CSS37	24										
3.	Synopsis:	Students objective proposa of the co	s will carry out weekly discussion with their supervisor on the research topic, e, scope, research programme, and the extent of the development of the research I. A final report and a presentation of the research proposal are required at the end purse.										
4.	Name(s) of academic staff:	Appoint	ted Supervising Lecturer										
5.	Semester and year of offered	Semest	Semester 2, Year 3										
6.	Credit value:	4	•										
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3714 Final Year Project I										
8.	Learning	Program	nme Educational Objectives (PEO):										
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		Program Upon c	nme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and										
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and										
		PLO8	Communicate effectively with the computing development community and with the society at large, and										
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.										
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:										

				CLO1	Ack of s	nowle elf-up	edge th gradin	ne coi g (A1	ntinuc , PLC	ous de 09)	evelo	pment of kno	wledge and t	he needs	
				CLO2	Exe	cute a	an eng	ineer	ing re	searc	h pro	ogramme (C3	, PLO4)		
				CLO3	Ana	alyse t	he res	earch	data	(C4,	PLO	3)			
				CLO4	Dise rese	cuss t earch	he sig (C2, F	nifica PLO3)	nces,	resu	lts, ju	ustifications, fi	ndings and ir	npacts of	
			_	CLO5	Cor PLC	nclude D5)	the	resea	rch f	inding	js ar	nd outcomes	with confide	nce (C5,	
			-	CLO6	Pro	oduce an academic writing (C3, PLO8)									
9.	Mapping o	of the	Cour	se Lea	arning	Outo	comes	s to t	he Pr	ogra	mmi	ng Learning	Outcomes, 1	Feaching	
	Course		F	Program	me Lea	rning (Dutcom	es (PL	.0)						
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO8	B PLO	9 T	eaching Method	ls Assess	Assessment	
	CLO1									3	Pi Pi Le	roject Supervisior roblem-based earning, Researcl	^{n,} Lecturer Ev Written Rep	valuation,	
	CLO2				3						P	roject Supervisior roblem-based	n, Lecturer Ev Written Rep	valuation,	
	CLO3			3							P	roject Supervisior roblem-based	^{n,} Lecturer Ev Written Rep	valuation,	
	CL04 2										P	roject Supervisior roblem-based	n, Written Rej	oort	
	CLO5					2					P	roject Supervisior roblem-based	n, Written Rej Presentatio	port, pn	
	CLO6								2		P	roject Supervisior roblem-based	n, Written Rej Presentatio	port, pn	
	Note: 1 = Lit	tle Cont	tributio	n; 2 = Me	oderate	Contrib	oution; 3	B = Stro	ng Coi	ntributio	on	earning, Researci			
10.	Transferat (if applicat	ole ski ole):	lls	Proble Social Skills;	em so Skills Practi	lving and ical Sk	and s Respo kills	cienti Insibil	fic sł ities;	kills; ` Inforr	Value natio	es, Attitudes, n Manageme	and Profess nt & Lifelong	sionalism; Learning	
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:							
									Теа	aching	and I	Learning Activiti	es	Total	
	Coι	irse Co	ntent (Outline		CL	0	Guideo	Learı	ning (F	2F)	Guided Learning	Independent Learning	SLT	
	1. Conductir • Preparin	ig the R g the e	esearc experin	h Progra	amme etup or	1,2	2		1	P	0	(NF2F) 5	(NF2F)	5	
	sampling tools 1. Conducting the Research Programme – cont			amme –	1,2	2					5		5		
	 Preparing and collecting samples 1. Conducting the Research Programme - 														
	 cont. Conducting the experiments/survey 					1,2	2					5		5	
	 2. Analysis of Data – cont. Collecting and compiling research data 2. Analysis of Data – cont 					3,4	1					5		5	
	2. Analysis o Analysis	 2. Analysis of Data – cont. Analysing and interpreting the results 2. Analysis of Data – cont 										5		5	
	 Presenti chart, tal 	3,4	1					5		5					

	 2. Analysis of Data – cont Formulating the finding 	t. Igs	3,4					5		5
	 2. Analysis of Data – cont Concluding the finding Proposing for future reference 	5					8		8	
	 3. Documentation of Thes Fine tuning Chapter 7 research proposal 	6					5		5	
	3. Documentation of ThesWriting the analysis o	6					5		5	
	3. Documentation of Thes Writing the analysis o	6					5		5	
	3. Documentation of ThesPreparing charts and	6					5		5	
	3. Documentation of Thes Writing up co recommendation	6					5		5	
	4. Final thesis submissionSubmission of final th						1		1	
		al (SLT)	-	-	-	-	69	-	69	
	Continues		Percentage (%)						Total SLT	
	1. Lecturer Evaluation						10		7	
	2. Presentation		10						4	
	3. FYP I (carry forward)		40							
	Final As		Percentage (%)							
	1. Written Report		40							
		al (SLT)	(SLT) 100%							
	GRAND TOTAL SLT								160	
	L = Lecture, T = Tutorial, P = Practical, O = Others, F2F = Face to Face, NF2F = Non Face to Face									
12.	Identify special requirement or resources to deliver the course:	lentify special aquirement or agources to None eliver the course: Image: source of the course of the								
13.	Keterences:	 Crewell, J. D. & Creswell, J. W. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 5th Edition. SAGE Publications Inc. ISBN: 9781506386768 Pyrczak, F. & Bruce, R. (2017). Writing Empirical Research Reports: a Basic Guide for Students of the Social and Behavioral Sciences, 8th Edition. London: Routledge. ISBN: 9781936523368 Additional references: O'Regan, G. (2019). Concise guide to software testing. Springer. ISBN: 9783030284930 Shen, J. J. (2019). Software testing: techniques, principles and practices. Independently Published. ISBN: 9781693054907 Sommerville, I. (2011). Software engineering. Boston: Pearson. ISBN: 978- 0137035151 Pressman, R. & Maxim, B. (2015). Software engineering: a practitioner's approach. New York, NY: McGraw-Hill Education. ISBN: 978-0078022128 Braude, E. & Bernstein, M. (2011). Software engineering: modern approaches. Hoboken, NJ: 1, Wiley & Sons, ISBN: 978-0471-69208-0 								
		• Tsui, F., Karam, O. & Bernal, B. (2014). Essentials of software engineering, third edition. Burlington, Mass: Jones & Bartlett Learning. ISBN: 978-1449691998								
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14.	Other additional information:	None								

1.	Course Name	Creativ	ity and Inr	novation							
2.	Course Code	UCS32	12								
3.	Academic Staff Name(s)	Nurzali	kha Binti S	Sa'adi							
4.	Rationale for the inclusion of the Course in the Programme	Develo learning	ping stude g and to p	ent's crea repare th	tivity in thi emselves	nking and innovat in working enviror	ion as part of their nment challenges.				
5.	Semester and Year Offered	Semes	ter 2, Yea	ır 3							
6.	Total Student Learning Time (SLT)		Face to F	Face (F2F	;)	Non Contact (Non F2F)	Total Guided and Independent learning				
	L = Lecture	L	Т	Р	0						
	P = Practical O = Others	28	0	0	0	52	80				
7.	Credit Value	2									
8.	Prerequisite (if any)	None	None								
9.	Course Learning	Upon o	Upon completion of this course, students should be able to:								
	Outcomes (CLOS)	CLO1	Describe PLO1)	e the func	lamental o	of creative thinking	and innovation (C2,				
		CLO2	Demons learnt (C	strate crea	ativity in th)	inking through pro	blem solving using skills				
		CLO3	Develop	o innovativ	/e ideas o	r value through m	ethods learnt (C6, PLO7)				
10.	Transferable Skills		Skills		Develop	oment Methods	Assessment Methods				
		Knowle	dge		Lecture, Discussi	Group on	Assignment, Final Examination				
		Probler Scientif	n Solving fic Skills	and	Group D	viscussion	Assignment				
		Manage Entrepr	erial and eneurial S	Skills	Group D	viscussion	Assignment				
11.	Teaching-learning and Assessment Strategy	Теас	hing-Lea Strategy	rning	ng Assessment Strategy MQF LO Domain						
		Lecture)		Assignm Examina	nent, Final ation	Knowledge				
		Group	up Discussion Assignment, Final Examination Problem Solving and Scientific Skills								

							Managerial and Entrepreneurial Skills			
12.	Synopsis	This subj principles technique creative a	ject exp s of thir es, crea and inn	plores creat nking, meth ativity in wr novative pro	tivity and in ods of gen iting as we oduct throug	novation thinking erating ideas, cre Il as giving the ex gh project given.	skills with an exposure of eativity in problem solving perience of producing			
13.	Mode of Delivery	Lecture,	Group	Discussion						
14.	Assessment			Asses	sment		%			
	Methods and Types	Final Exa	aminatio	on			50			
		Continuo	ous Ass	sessment			50			
					Continuo	us Assessment				
		CLO	-	Teaching-I Strate	earning egy	Assessment	%			
		2, 3	A	ssignment		Group Assignment	40			
		2, 3	A	ssignment		Presentation	10			
15.	Mapping of the	The obje	ectives	s of the pro	gramme a	re:				
	Programme Aims	PEO 1	Grade engin with a	luates will b neering field appropriate	e employe I with good attitude er	d or self-employe level of knowled nabling them to h	ed in relevant software ge and competency skills ave successful career			
		PEO 2	Grad collat throu	luates will a borative wo ıgh professi	cquire abili rking in div onal involv	ities for effective erse teams, and ement	communication, l continual development			
		PEO 3	Grad adva profe	luates will p ncement of essions and	ursue lifelo information related con	ong learning in or n technology and ntemporary issue	der to contribute to the computer science s			
		Course	9		Program	me Educational	Objectives			
		Learnin Outcom	es	PEO	1	PEO 2	PEO 3			
		CLO 1		3						
		CLO 2	!			2				
		CLO 3			2					
		Note: 1 = L	ittle Con.	ntribution; 2 =	Moderate Co	ntribution; 3 = Strong	Contribution			
16.	Mapping of the	The lear	ning o	outcomes o	f the prog	ramme are:				
	Programme Learning	PLO 1	Apply princi	y knowledg iples, skills,	e and unde , and theori	erstanding of esse les relating to So	ential facts, concepts, ftware Engineering			
	Outcomes	PLO 2 Apply theoretical principles of Software Engineering in relevant areas								

			PLO 3	De pro im lar	emonst ovide a plemer rge-sca	rate ap basis f ntation, le softw	propri for an evalu vare s	ate r alysis atior	neth s, de n, ma m	odolo sign, ainten	gies, deve ance,	mo lopr , an	dels, ment d do	tech , test cume	inique: and entatio	s tha n of	at Fa
			PLO 4	Us thi	se relev inking s	/ant tec skills in	hniqu proble	es a em s	nd d olvin	emon g	strate	e an	alyti	cal a	nd criti	ical	
			PLO 5	Co etl	onduct hical ar	profess nd legal	sional I princ	and iples	ethic	al res	pons	ibili	ties i	n aco	cordar	nce v	with
			PLO 6	Fu of	unction a leade	effectiv er or a t	vely bo team	oth a mem	s ind ber	lividua	als an	ıd ir	n a g	roup	in the	сар	acity
			PLO 7	Ap de pra	oply bro emonstr actice	oad bus rate ent	iness trepre	and neurs	real ship	world skills	pers relate	pec ed t	tives o sof	s dail twar	y and e engii	nee	ring
			PLO 8	Co co	ommun ommuni	icate ef ty and	ffectiv with th	ely w ne sc	/ith tl ociety	he so / at la	ftware rge	e sy	vsten	n dev	elopm	ent	
			PLO 9	Ap ca	oply ski Ireer de	lls and evelopm	princi nent	ples	of life	elong	learn	ing	in bo	oth a	cadem	nic a	and
			Course	•			Pr	ogra	Imm	e Lea	rning	g O	utco	mes			
			Learnin Outcom	ig es	PLO 1	PLO 2		PI 0 3	PLO 4	2	PLO 5		909	PLO 7	LC 0		PLO 9
			CLO 1		3												
			CLO 2	2					2								
			CLO 3	6										2			
			Note: 1 = L	ittle	Contribut	tion; 2 =	Modera	ate Co	ontribu	ution; 3	= Stro	ong	Contri	butior	1		
17.	Content	Outline of th	e Course	and	the SL	T per	Торіс	;									
						Stud	lent L	.earn	ing	Time	(SLT)					
										F			ours)			ment	
	Week	Cour		Lecture	Tutorial	-	Practical	Test & Exai	Colf. Cturdy	0ell-0(44)	Total (H	-		Assess			
1 1. Introduction to Creativity and Innovation • Definition • Difference of Creativity and Innovation • Understanding the circle of innovation									-	-	3	3	5		Assią F Exan	gnm Final nina	ent, tion

2	 2. Breaking Through Thought Patterns and Assumptions Recognizing left and right brain thinking Identifying self-creativity 	2	-	-	-	3	5	Assignment, Final Examination
3	 3. Methods and tools for generating ideas Simple techniques to develop creativity Identifying ways to further develop creative thinking 	2	-	-	-	3	5	Assignment, Final Examination
4	 3. Methods and tools for generating ideas - cont. Brainstorming techniques 	2	-	-	-	3	5	Assignment, Final Examination
5	 4. Logical versus Lateral Thinking Difference between logical and lateral thinking 	2	-	-	-	3	5	Assignment, Final Examination
6	 4. Logical versus Lateral Thinking - cont. Appreciating the strength of thinking 	2	-	-	-	3	5	Assignment, Final Examination
7	 5. Creative Problem Solving Creative problem solving techniques 	2	-	-	-	3	5	Assignment, Final Examination
8	 5. Creative Problem Solving - cont. Applying to work related problems 	2	-	-	-	3	5	Assignment, Final Examination
9	 5. Creative Problem Solving - cont. Turning creative ideas to action 	2	-	-	-	3	5	Assignment, Final Examination
10	 6. Innovation Process Definition and differences between research and development; invention vs innovation 	2	-	-	-	3	5	Assignment, Final Examination

	11	 6. Innovation Process - cont. Different types of innovation Understanding the innovation pipeline 	2	-	-	-	3	5	Assignment, Final Examination
	12	 7. Value Innovation Definition of value innovation 	2	-	-	-	3	5	Assignment, Final Examination
	13	 7. Value Innovation - cont. Tools and techniques to develop value and utility 	2	-	-	-	3	5	Assignment, Final Examination
	14	 8. Creativity and Innovation in Real Life Lecture series by invited speaker 	2	-	-	-	3	5	Assignment, Final Examination
	15	Revision	-	-	-	-	8	8	
	16-17	Examination	-	-	-	2	-	2	
		Total	28	-	-	2	50	80	
		Notional hours			4	0			
		Credit value			2	2			
18.	Main re Mic Pre Thc	ferences supporting the course: hael Michalko (2011), Thinkertoys: ss. mas Vogel (2014). Breakthrough T	A Han	idbook : A Gui	of Crea	ative-Th Creative	ninking • Thinki	Techni	ques. Ten Speed

- Thomas Vogel (2014). Breakthrough Thinking: A Guide to Creative Thinking and Idea Generation. HOW Books.
- Michael Michalko (2011), Creative Thinkering: Putting your imagination to work. New World Library.
- Colin G Smith (2013). Creative Problem Solving Techniques to Change Your Life. CreateSpace Independent Publishing Platform.
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- Max McKeown (2014). The Innovation Book: How to Manage Ideas and Execution for Outstanding Results. FT Publishing International.
- Tony Davila, Marc Epstein, Robert Shelton (2013). Making Innovation Work: How to Manage it, Measure it, and Profit from it. Pearson FT Press.
- Rangarirai Mbizi (2012). Principles of Innovation and Technopreneurship: Innovation and Technology Commercialisation. Lap Lambert Academic Publishing.
- W. Chan Kim, Renée Mauborgne (2005). Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Harvard Business School Publishing Corporation.

Additional references supporting the course:

- Mitchell Rigie, Keith Harmeyer (2013). SmartStorming: The Game-Changing Process for Generating Bigger, Better Ideas. Dog Ear Publishing.
- Christophe Semples (2013). Sustainable Innovation Strategy: Creating Value in a World of Finite Resources. Palgrave Macmillan.
- F. Scott Kieff, Troy A. Paredes (2012). Perspectives on Commercializing Innovation. Cambridge University Press.
- Larry Keeley, Helen Walters, Ryan Pikkel, Brian Quinn (2013), Ten Types of Innovation: The Discipline of Building Breakthroughs, Wiley.
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- Darin J. Eich (2014), Innovation Step-by-Step: How to Create and Develop Ideas for your Challenge. CreateSpace Independent Publishing Platform.
- Rowan Gibson (2015). The Four Lenses of Innovation: A Power Tool for Creative Thinking. Wiley.
- Alexander Osterwalder (2014). Value Proposition Design: How to Create Products and Services Customers Want. Wiley.
- Alexander Osterwalder (2010). Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley and Sons.
- Clayton M Christensen (2000). Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Harvard Business Review Press.

1.	Course Name	Green	Green Technology								
2.	Course Code	UCS33	12								
3.	Academic Staff Name(s)	Nurzali	kha Binti S	Sa'adi							
4.	Rationale for the inclusion of the Course in the Programme	This co natural	urse aims environm	to develo ent and r	op studen esources.	ts' awareness to e	volve in conservation of				
5.	Semester and Year Offered	Semes	ter 2, Yea	r 3							
6.	Total Student Learning Time (SLT)		Face to F	ace (F2F	;)	Non Contact (Non F2F)	Total Guided and Independent learning				
	L = Lecture T = Tutorial P = Practical O = Others	L 28	Т 0	P 0	O 0 52 80						
7.	Credit Value	2					•				
8.	Prerequisite (if any)	None	None								
9.	Course Learning	Upon o	Upon completion of this course, students should be able to:								
	Outcomes (CLOS)	CLO1	Understa principle	and the fu s in gene	undament eral. (C2, F	al of green techno PLO 1)	logy terminology and				
		CLO2	Demons professio	trate the on. (C3, F	green val PLO 5)	ue and role as a m	nember of an established				
		CLO3	Develop health ai in future	awarene nd safety . (C6, PL	ess in ener life withor O 9)	rgy saving, envirol ut damaging or de	nmental conservation, pleting natural resources				
10.	Transferable Skills	Skills			Develop	oment Methods	Assessment Methods				
		Knowle	dge		Lecture, Discussi	Group ion	Progress Test / Quiz, Final Examination				
		Values, Profess	, Attitude a sionalism	and	Lecture, Discussi	Group ion, Assignment	Progress Test / Quiz, Assignment, Presentation				
		Informa Manage Lifelone	ation ement and g Learning	l Skills	Lecture, Discussi	Group ion	Progress Test / Quiz, Assignment, Presentation				
11.	Teaching-learning and Assessment	Теас	hing-Lea Strategy	rning	Assess	sment Strategy	MQF LO Domain				
	Siraleyy	Lecture)		Progress Test / Quiz, Knowledge Assignment, Presentation						

						Values, Attitude and Professionalism		
						Information Management and Lifelong Learning Skills		
		Group Di	scussion	Progress	Test / Quiz,	Knowledge		
				Presenta	tion	Values, Attitude and Professionalism		
						Information Management and Lifelong Learning Skills		
		Assignme	ent	Assignme	ent	Knowledge		
						Values, Attitude and Professionalism		
						Information Management and Lifelong Learning Skills		
12.	Synopsis	This subj fundamer green bui green ecc	ect explores th ntal green princ ildings, alterna onomics.	e green techi ciples in recyc tive energy, g	hology with basic cling, green home preen transportation	knowledge and living, green daily life, on, green business and		
13.	Mode of Delivery	Lecture, (Group Discuss	ion, Assignm	ent			
14.	Assessment Methods and Types		Ass	sessment		%		
	methous and Types	Final Exa	imination			50		
		Continuo	us Assessmen	t		50		
				Continuo	us Assessment			
		CLO	Teachin Str	g-learning ategy	Assessment	%		
		1, 2 Lecture, Tuto		1, 2 Lecture, Tut		utorial	Progress Test / Quiz	10
		2, 3	Assignme	ent	Assignment	30		
		1, 2, 3	Assignme	nt	Presentation + Q&A Evaluation	10		
15.	Mapping of the	The obje	ctives of the p	programme a	are:			
	Programme Aims	PEO 1	Graduates wi engineering f with appropri	Il be employe ield with good ate attitude e	ed or self-employed d level of knowled nabling them to h	ed in relevant software lge and competency skills ave successful career		

		PEO 2	Gr co thi	raduate Illabora rough p	es will acc tive work professior	quire abil ing in div nal involv	ities for /erse te /ement	effectiv ams, ar	re comn nd conti	nunication nual dev	on, velopme	ent	
		PEO 3	Gr ad pr	raduate Ivancer ofessio	es will pur ment of ir ns and re	sue lifelo formatio elated co	ong lear in techn intempo	ning in ology a rary iss	order to nd com ues	o contrib puter sc	oute to ti cience	he	
		Course)			Program	nme Ed	ucatior	nal Obje	ectives			
		Outcome	g es		PEO 1			PEO 2			PEO 3		
		CLO 1			3								
		CLO 2						2					
		CLO 3									1		
		Note: 1 = L	ittle	Contribu	tion; 2 = Mo	oderate Co	ontributio	n; 3 = Stro	ong Contr	ribution			
16.	Mapping of the	The lear	ninç	g outco	omes of t	the prog	ramme	are:					
	Programme Learning	PLO 1	Ap pri	oply kno inciples	owledge a s, skills, a	and unde Ind theor	erstandi ies rela	ng of es ting to \$	ssential Software	facts, c e Engine	oncepts eering	ots, J	
	Outcomes	PLO 2	Apply theoretical principles of Software Engineering in relevant areas										
		PLO 3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale software system										
		PLO 4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving										
		PLO 5	Co etl	onduct hical ar	professio nd legal p	onal and principles	ethical	respons	ibilities	in accol	rdance	with	
		PLO 6	Fu of	unction a lead	effectivel er or a tea	ly both a am mem	s indivio ber	duals ar	nd in a g	roup in	the cap	oacity	
		PLO 7	Ap de pra	oply bro emonsti actice	oad busin rate entre	ess and preneurs	real wo ship ski	rld pers Ils relate	pective ed to so	s daily a ftware e	and enginee	ring	
		PLO 8	Co co	ommun ommuni	icate effe ty and wi	ectively w th the sc	vith the ociety at	softwar large	e syster	n develo	opment		
		PLO 9	Ap ca	oply ski reer de	lls and pr evelopme	rinciples nt	of lifelo	ng learr	ning in b	oth aca	demic a	and	
		Cource				Progra	imme L	earnin	g Outco	omes			
		Learnin	g es	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	
		CLO 1	CLO 1 3										

			CLO 2						2				
			CLO 3										1
			Note: 1 = Little	Contribut	tion; 2 =	Moderate	e Contrib	ution; 3 =	= Strong	Contrib	ution		
17.	Content	Outline of th	e Course and	the SL	Tper	Торіс							
					Stud	lent Le	arning	Time (SLT)				
	Week	Cour	se Materials		Lecture	Tutorial	Practical	Test & Exam	Self-Study	Total (Hours)		Assessment	
	1	 Introdu Technology Global Sustair Harmon Changi for a Herican 	ction to (Warming hable Living hy ng Energy Hal ealthier Future	Green in bits	2	-	-	-	2	4	P	rogress Final Examina	Test, I
	2	 2. 3R- Rec Recycle A Trasl Zero W Reduci with Le 	duce, Reuse ny Odyssey /aste ng: Doing Mor ss	and e	2	-	-	-	3	6	P	rogress Final Examina	Test, Ition
	3	 2. 3R- Rec Recycle - co Reusin Recycli Comes 	duce, Reuse ont. g: Use it Agair ng: Goes Arou Around	and 1 Jind	2	-	-	-	3	6	Pi /	rogress Assignm Final Examina	Test, ent, ition
	4	 Going G Saving Saving Waste Preserv Reduce 	reen at Home Energy at Hom Water at Hom Value After Us ving Resource waste stream	me e se: s - n	2	-	-	-	3	5	P /	rogress Assignm Final Examina	Test, ent, ition
	5	 Green Li Green Hybrids Option Transp Home I 	ving on the F Driving and Other (ortation Beyor Base	Road Green	2	-	-	-	3	5	P /	rogress Assignm Final Examina	Test, ent, ition

6	 5. Green Daily Life Chemicals in Foods Chemicals in Cosmetics and Body Care Products Chemicals in Cleaning Products Creating a Green Home Interior Greener Lawn Responsible Shopping 	2	-	_	_	4	5	Progress Test, Assignment, Final Examination
7	 6. Green Business Greening the Workplace & Study Place Greener Business Travel Buying Carbon Offsets Corporate Giving 	2	-	-	-	3	5	Assignment, Final Examination
8	 7. Green Building What is Green Building Green Building Rating Tools Green Building Strategies 	2	-	-	-	3	5	Assignment, Final Examination
9	 8. Green Economics: Economics for People and the Planet Why Green Economics What is Green Economics From Economic Growth to a Balanced Economy Where do We Go from Here? 	2	-	_	_	4	5	Assignment, Final Examination
10	 9. Alternative and Renewable Energy Why New Energy Sources Needed Wind Energy Solar Energy Water Power 	2	-	-	-	3	5	Assignment, Final Examination
11	 9. Alternative and Renewable Energy - cont. Geothermal Plants Bioenergy Hydrogen Fuel Cells 	2	-	-	-	3	5	Assignment, Final Examination
12	 10. Conservation: Protecting Our Plant Resources Forest and the Water Cycle Analysing Threats to Forests 	2	-	-	-	3	5	Assignment, Final Examination

	13	 10. Conservation: Protecting Our Plant Resources - cont. Tropical Forest Preservation Saving Riparian Habitats Reducing Wood Waste 	2	-	-	-	3	5	Assignment, Final Examination
	14	 11. Getting Involved Activism Begins with You Environmentally Responsible Investing 	2	-	-	-	4	6	Assignment, Final Examination
	15	Revision	-	-	-	-	6	6	
	16-17	Examination	-	-	-	2	-	2	
		Total	28	-	-	2	50	80	
		Notional hours			4	0			
		Credit value				2			
18.	Main ref • Tri • Na	ferences supporting the course: sh Riley (2007). The Complete Idiot ancy Conner (2009). Green Living: T	's Guid he Miss	e to Gr sing Ma	een Liv anual, 1 r Plant	ing. Pe st Editi	nguin (on. O'F	Group, I Reilly Me	nc. edia, Inc. Filo, Inc.

- Anne Maczulak (2010). Conservation: Protecting Our Plant Resources. Facts on File, Inc.
- Anne Maczulak (2010). Renewable Energy: Sources and Methods. Facts on File, Inc.
- U. Aswathanarayana (2010). Green Energy Technology, Economics and Policy. Taylor & Francis Group.

Additional references supporting the course:

- Diane Gow McDilda (2008). *365 Ways to Live Green*. Adams Media, an F+W Publications Company.
- Molly Scott Cato (2009). *Green Economics: An Introduction to Theory, Policy and Practice*. Earthscan
- Tom Woodley (2001). Green Building Handbook, Vol 1. Taylor & Francis Group.

1.	Name of course:	Industrial	Training										
2.	Code of course:	CSS3812	2										
3.	Synopsis:	To expose science; to the class to skills in pre	e students to the real working environment related to computer provide opportunity for the students to apply knowledge gained in to solve problems in real life situation; and to enhance students' eparation and presentation of reports.										
4.	Name(s) of academic staff:	Gary Loh	Chee Wyai, AP Dr Tariq Zaman										
5.	Semester and year of offered	Semester	1, Year 4										
6.	Credit value:	12											
7.	Prerequisite/co-requisite (if any):	Successfu	I completion of Year 3										
8.	Learning outcomes:	Programme Educational Objectives (PEO):											
		PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.										
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.										
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.										
		<u>Programm</u> Upon com	<u>e Learning Outcomes (PLO):</u> pletion of the programme, the graduates should be able to:										
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and										
		PLO2	Apply theoretical principles of computer science in relevant areas, and										
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and										
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and										
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and										
		PLO6 Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7 Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and										

				F	PLO9	4	Apply s and car	kills an eer dev	d prino velopm	ciples ent.	of lifelong le	arning	in both a	academic	
				<u>C</u> L	Course Jpon c	e Lear compl	rning O etion of	utcome the co	<u>s (CLC</u> urse, tl	<u>)):</u> ne stu	dents should	be ab	le to:		
				C	CLO1		Educa the fie attitude	te grad ld of so e to wo	uates oftware rk in th	with s engi e indu	sufficient kno neering in sy ustry (C1, PL	wledge /nc wit O1)	e and ski h approp	lls in priate	
				C	CLO2		Develo comm and co involve	op grad unicatio ntinual ement (uates v n, colla develo A2, PL	with al aborat opmer O8)	bilities for effe tive working i at through pro	ective In dive ofessio	rse teams nal	5,	
				C	CLO3		Provid engine learnir conter	e educa ering a g, stay nporary	ation fo nd tech inform rissues	or the hnolog ed of s (C6,	nurturing of r gy who are en the emerging PLO9)	esearc ngageo g techr	chers in s d in lifelor lologies a	oftware ng ind	
				C	CLO4		Demo gradua PLO5)	nstrate ate and	the res involve	ponsi e in th	bilities as cor e industrial w	mputer /ith ent	science husiasm	(C3,	
9.	Mapping of the Course Learning Outcomes to the Programming Learning Outcomes, Teaching Methods and Assessment: Course Programme Learning Outcomes (PLO)														
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO		PLO7	PLO8	PLO9	Teachin Method	g s	Asses	sment	
	CLO1	(CLO) CLO1 3									Written Presentation, Assessment Supervisor/Me Logbook	Report, by entor,	Written Presentati Assessme Superviso Log Book Diary	Report, on, nt by r/Mentor, and Work	
	CLO2								3		Written Report Presentation, Assessment by Supervisor/Mentor, Logbook		Written Report, Presentation, Assessment by Supervisor/Mentor, Log Book and Work Diary		
	CLO3									3	Written Presentation, Assessment Supervisor/Me Logbook	Report, by entor,	Written Presentati Assessme Superviso Log Book Diary	Report, on, int by r/Mentor, and Work	
	CLO4					3					Written Presentation, Assessment Supervisor/Me Logbook	Report, by entor,	Written Presentati Assessme Superviso Log Book Diarv	Report, on, nt by r/Mentor, and Work	
	Note: 1 = Littl	e Contri	bution; 2	2 = Mod	lerate C	Contribu	ution; 3 =	Strong C	Contribut	ion			2.0.7		
10.	Transferabl applicable):	e skill	s (if	K	Knowle Lifelon	edge; g Lea	Social rning S	Skills a kills; Va	nd Res alue, A	spons ttitude	ibilities; Infor es and Profes	mation ssional	Manage ism	ment and	
11.	Distribution	of St	udent	Learn	ning T	ime (SLT):		T		La annaire - Arrit	141		[]	
	Cours	se Cont	ent Out	line		CLO	Gu	ided Lea	rning (I	ig and F2F)	Learning Activ Guided	Inde	pendent	Total	
			Jin Out			520	L	т	P	0	Learning (NF2F)	Lea (N	arning IF2F)	SLT	
	Industrial Trai Documentatio Software deve	ning n elopmen	ıt			1,2,3,	4					(NF2F) (NF2F) 480 4			

	Software testing Project management Modelling etc	Total (SLT) -	-	-	-	-	480	480					
	Continues Assess					Dava			Total					
		nent				Perc	entage (%)		SLT					
	Final Assessme	nt		Percentage (%)										
		Total (SI T					100%		480					
		10101 (021	<u> </u>				GR	AND TOTAL SLT	480					
	L = Lecture, T = Tutorial, P = Praction	cal, O = Others, F	2F = Fac	e to Fac	e, NF2F	= Non	Face to Face							
12.	Identify special requirement or resources to deliver the course:	Twenty-four consulting or Weekly logbo student inter	weeks o constru ook sub nship.	on job t Iction f missic	raining irms, c n is th	g at (a develo nrough	ny of the follo pment firms, Google For	owing) material s government de m for easy mor	suppliers, partment. hitoring of					
13.	References:	Main referen • Nil <u>Additional ref</u> • Nil	ces: erence	<u>s:</u>										
14.	Other additional information:	None												

1.	Name of course:	Compu	ter Vision and Image Processing												
2.	Code of course:	CSS39	13												
3.	Synopsis:	This co comput to deve	burse provides the students with advanced knowledge and techniques of the vision that simulates the biological vision, so that the students are able lop software that is used in computer vision field.												
4.	Name(s) of academic staff:	Ting Hu	uong Yong												
5.	Semester and year of offered	Elective													
6.	Credit value:	3													
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3123 Data Structure and Algorithms												
8.	Learning	Program	mme Educational Objectives (PEO):												
	outcomes:	PEO1	 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career. Graduates will acquire abilities for effective communication, collaborative 												
		PEO2	 appropriate attitude enabling them to have successful career. Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement. 												
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.												
		Program Upon c	<u>nme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:												
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and												
		PLO2	Apply theoretical principles of computer science in relevant areas, and												
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and												
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and												
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and												
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and												
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and												
		PLO8	Communicate effectively with the computing development community and with the society at large, and												
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.												
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:												

				CLO1	Exp regi	lain m ons, v	ethod arious	s for s high	deco ner o	ompos der in	sing nag	g an ge fe	n image into b eatures. (C2,	basic element PLO2)	s: edges,
				CLO2	App PLC	ly the 03)	techn	iques	s for	extrac	ting	g in	formation fro	m digital imag	gery. (C3,
				CLO3	Buil	d app	licatio	n by	using	com	oute	er v	rision algorith	m. (C6, PLO4	4)
9.	Mapping of Mathematics	of the	Cour	se Lea	arning	Outo	omes	to t	he F	rogra	mr	min	g Learning	Outcomes, 1	Feaching
	Course		P	rogram	me Lea	rning C	Outcom	es (P	LO)						
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	08 PL	09	Te	eaching Method	ls Assess	sment
	CLO1		3									Le	cture, Tutorial	Progress T Final Exam Assignmen	est, ination, t
	CLO2			3								Le	cture, Tutorial	Progress T Final Exam Assignmen	est, ination, t
	CLO3				3							Pra bas	actical, Compute sed Learning	er- Assignmen	t
	Note: 1 = Lit	tle Cont	tributior	n; 2 = Ma	oderate	Contrib	ution; 3	s = Stro	ong Co	ontribut	ion				
10.	Transferat (if applical	ole ski ole):	lls	Knowl	edge;	Practi	cal Sk	ills; I	Probl	em sc	olvir	ng a	and scientific	skills.	
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)								1
								Guida	T	eaching	g an	nd L	earning Activiti	es Independent	Total
	Coi	urse Co	ntent (Outline		CLO	0	L	T	P) 0	Learning (NF2F)	Learning (NF2F)	SLT
	1. Introduction	on to Co uman vi omputer	mpute sion vision	r Vision		1		2	1				3	(112)	6
	2. Digital Im Im Im G	age Fun hage Ach hage Dis raphics	idamen quisitio splay Format	ntals n		1,2	2	2	1				3		6
	3. Image En • Tł • M • No • Hi	hancem hreshold ean and earest N stogram	ient ling I Stand leighbo n	ard Devi our Filter	ation ing	1,2	2	2		1				3	6
	4. Convoluti • M • G	on edian Fi aussian narpenir	Itering Smoot ng Filte	hing rs – Lap	lacian	1,2	2	2		1				3	6
	5. Labelling • Eo	Sharpening Pillers – Laplacian S. Labelling Edge Detection Hough Transform								1				3	6
	6. Grouping Se		1,2	2	2		1				3	6			
	7. Matching • Bi		1,2	2	2		1	1			3	6			
	8. Matching Te		1,2	2	2		1	T			3	6			
	9. Transform • Fr • Fc • Fc	tions ages	1,2	2	2	1					3	6			
	10. Transfor cont. • Fi • Lo Pass Filterin	ming Im Itering o ow-Pass	age Re f Image Filter	epresenta es ing and	ations – I High-	1,2	2	2		1				3	6

	Removal of Per	riodic Noise												
	 11. Textures Statistical met analysis 	hods of texture	1,2	2	1				3	6				
	 12. Colour Fundamentals Colour models Processing of content 	colour images	1,2	2		1			3	6				
	 13. Advance Techniques Introduction to Rule based system 	decision making stems	1,2	2	1				3	6				
	14. Advance TechniquesClassifications		1,2	2		1			3	6				
		Tot	al (SLT)	28	5	9		6	36	84				
				1										
	Continues	Assessment					Percer	ntage (%)		Total SLT				
	1. Progress Test							10		4				
	2. Assignment							30		20				
	3. Presentation				2									
	Final As	sessment					Percer	ntage (%)		Total SLT				
	1. Final Examination							50		10				
		Tot	al (SLT)				1	00%		36				
	L – Lecture, T – Tutorial, P	- Practical O - O	thers E2E	F = Face to Face, NF2F = Non Face to Face										
			11013, 1 21	-1 ace		5, INI 21	- 11011							
12.	Identify special requirement or resources to deliver the course:	Computer vis	ion and	digital	image	e proce	essing	libraries						
13.	References:	Main reference Gonzale ISBN: 97 Parker, Compute Additional reference Petrou, Chichest	<u>2es:</u> z & Wo 78-0-133 J. & Terz J. & Terz er vision. erences M. & F ter, U.K:	ods (2 3-3567 zidis, ł Indiai <u>:</u> Petrou Wiley	2018). 72-4. K. (201 napolis , C. (v. ISBN	Digital 1). Alg s, Ind: 2010). I: 978-	imag gorithr Wiley . Ima 0-470	e processing ns for image Pub. ISBN: § ge processir)-74586-1.	, 4th Edition, processing ar 978-0-470-643 ng: the funda	Pearson. nd 385-3. amentals.				
14.	Other additional information:	None												

1.	Name of course:	Internet	ernetworking Technology												
2.	Code of course:	CSS39	23												
3.	Synopsis:	This co required - trouble - establ - under - identif - impler	urse will certify the successful candidate has the knowledge and skills d to:- eshoot, configure and manage common network devices lish basis network connectivity stand and maintain network documentation by network limitations and weaknesses ment network security, standards and protocols												
4.	Name(s) of academic staff:	Gary Lo	oh Chee Wyai												
5.	Semester and year of offered	Elective	ective												
6.	Credit value:	3													
7.	Prerequisite/co- requisite (if any):	Succes	uccessful completion of CSS3513 Data Communication and Networking												
8.	Learning	Program	gramme Educational Objectives (PEO):												
	outcomes:	PEO1	 cessful completion of CSS3513 Data Communication and Networking gramme Educational Objectives (PEO): O1 Graduates will be employed or self-employed in relevant computer scienc field with good level of knowledge and competency skills with appropriat attitude enabling them to have successful career. O2 Graduates will acquire abilities for effective communication, collaborativ working in diverse teams, and continual development through professiona involvement. O3 Graduates will pursue lifelong learning in order to contribute to th advancement of information technology and computer science profession and related competency issues. 												
		PEO2													
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.												
		<u>Prograr</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:												
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and												
		PLO2	Apply theoretical principles of computer science in relevant areas, and												
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and												
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and												
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and												
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and												
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and												
		PLO8	Communicate effectively with the computing development community and with the society at large, and												
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.												

			Co Up	ourse oon co	<u>Learni</u> mplet	<u>ng Out</u> ion of t	<u>comes</u> he cou	<u>; (CLO</u> rse, th	<u>):</u> e stude	ents sł	nould be ab	le to:					
			Cl	_01	Reco imple	gnise n ment a	etwork nd ma	comp nage tl	onents ne com	s, softv nputer	vare and se networks. (curity C2, PL	required t .O1)	o design,			
			CI	_02	Demo router comm	onstrate s and nunicati	and their	config interc dium.	ure ne perabi (C3, Pl	etwork llity w LO2)	equipment ith other r	t such networ	as swite k equipn	ches and nent and			
			Cl	_O3	Prepa	re and	desigi /ith coi	n comp mputer	outer n	étwork orks as	k, identify ar	nd trou	bleshoot 06)	problems			
9.	Mapping of Methods an	the C d Asse	ourse	e Lear ent:	ning	Outco	nes to	b the	Progra	ammir	ng Learnin	g Out	, ⊂ comes, ⊺	Feaching			
	Course			Progra	mme Le	arning (Outcom	es (PLC))								
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	Teachin Methoo	ng ds	Asses	sment			
	CLO1	3									Lecture, Pra Problem-ba learning	actical, sed	Progress Test, Assignment, Final Exam				
	CLO2		3								Problem-ba learning	actical, sed	Progress Assignme Exam	rt, Final			
	CLO3	CLO3 Note: 1 = Little Contribution; 2 = Moder						2 Practical, Presentation Problem-based learning									
	Note: 1 = Little	e Contrib	ution; 2	=Mode	erate Co	ontributio	n; 3 = S	trong Co	ontributio	on							
10.	Transferable (if applicabl	e skills e):	Kr	nowled	dge; C	ommur	nication	n, lead	ership	and te	am skills						
11.	Distribution	of Stu	dent	Learn	ing Ti	me (Sl	.T):										
								Т	eaching	g and Lo	earning Activ	ities					
	Cours	se Conte	ent Out	line		CLO	Guid L	ed Lear T	ning (F2 P	2F) O	Guided Learning (NF2F)	Inde Lea	pendent arning NF2F)	SLT			
	1. Introductio Connector • Cabling and • Coaxial Cab • Twisted Pair • Fibre Optics • RJ-45 Conn procedures • BNC Conne procedures	n to Net Connec De (BNC r: UTP at cables tectors at ctor and	tors) nd STP nd cram crampin	abling ping	and	1,2	1	2					3	6			
	2. Introductio hardware • Network ada • Patch panel • Mounting ac • Face plate a Module		1,2	1		2				3	6						
	3. Introductio hardware (co • Network Equ • Hubs • Switches • Router • Modem	3. Introduction to basic network hardware (cont) • Network Equipment Cabinet (NEC) • Hubs • Switches • Router • Modem							2				3	6			
	 4. Networking Bandwidth in Analogy to e Units of ban 	g Funda i n networ explain b idwidth	mentals king andwidt	s th		1,2,3	1		2				3	6			

 Difference between bandwidth and throughput Development 							
 5 Networking Fundamentals (cont) Four layers of the TCP/IP model Similarities and differences between the two models Understand the role of protocols in networking Define LAN, WAN, MAN, and SAN VPNs and their advantages Differences between intranets and extranets 	1,2	1		2		3	6
 6. Intermediate TCP/IP Describe TCP and its functions TCP synchronization and flow control Denial of service attacks Packet Filter Firewall Overview of Transport layer ports 	1,2	1		2		3	6
 7. Network Planning / Design Customer requirements Wiring schematics Implementation Schedule Labelling Methods Quotation/Tender Documentation 	1,2	1		2		3	6
 8. Network Hardware configuration Cabling Installation Procedure Network hardware adapter installation and configurations Hub installation Switch Installation and configurations 	1,2	1		2		3	6
 9. Network Hardware configuration (cont.) Spanning-tree protocol WAN technologies Access Control Lists PPP Network Security Tele-worker services Frame relay Router and general network troubleshooting 	1,2	1		2		3	6
 10.Network Hardware configuration (cont.) Router installation and configuration Routing fundamentals Dynamic routing Configuring routers and routing devices Configuring routers and routing devices Routing protocols (RIP, RIPv2, EIGRP, OSPF) Scaling IP addressing 	1,2	1	2			3	6
11. Network Security • Detection • Prevention • Authentication • Access controls • Basic wireless network • DNS & ARP poisoning • Brute force	1,2,3	1		2		3	6
 12. Network Security (cont.) DDoS Social Engineering Logic bomb Phishing Spoofing - Man-in-the-middle 	1,2,3	1		2		3	6

	13. Network Security (co • Device hardening • DMZ • Honeypo • Penetration testing	ont.)	1,2,3	1	2				3	6
	 14. Network troubleshoot troubleshooting method hardware and software - wired and wireless coperformance issues trop 	oting and tools dology e tools onnectivity and oubleshooting	1,2	1		2			3	6
		Tot	al (SLT)	14	6	22	-	-	42	84
	Continues /	Assessment					Perc	entage (%)		Total SLT
	1. Progress Test							20		4
	2. Assignment				22					
	Final Ass	sessment					Perc	entage (%)		Total SLT
	1. Final Examination				10					
		Tot	al (SLT)					100%		36
	L = Lecture, T = Tutorial. P	= Practical, O = C	thers, F2	F = Fac	e to Fac	e, NF2F	= Nor	Face to Face	AND TOTAL SET	120
13.	resources to deliver the course: References:	operati Networ Main referem • Emmet 978111 • Raymo PT0-00 • Nick Th Lab Gu • Nick Th Testing • Lowe, I Dummi • Burban Networ Additional ref • Bejtlich underst Press. • Donahu 978-14	ng syste k cables <u>ces:</u> t A Dula 941687 nd Nutti 1). McG nompsor ide. With nompsor Lab Gu D. (2012 es. ISB k, J., Ar king: Ur <u>ferences</u> , R. (20 tanding ISBN-10 ue, G. (2 4938786 tworking	em, C s aney (2 6 ng (2010 ey. ISE n (2010 uide. W 2). Netw N-10:1 ndrusk ndersta <u>5:</u> 13). Th incider 0:1593 2011). 60 g Chall	2017). (19). C lill US 6). Cyl 3N: 97 6). Cyl /iley. I workin 11838 o, J., E anding ne pra nt dete 27509 Netwo enges	Comp Comp Higher ber Se 81581 ber Se SBN: 9 SBN: 9	TIA se TIA se Ed Is curity 2219 curity 2219 curity 2219 curity 27815 n-One , J., K f netwand re rrior. S cawa	c, Router, Sv ecurity+ study nTest+ Certif SE. ISBN: 97 Essentials: 07 8 Essentials: 10 81222371 For Dummie Casch, T. (20 vork security esponse. San Sebastopol, C y, NJ: Wileey	vitch, Wifi Acce y guide. Wiley. I ication Bundle (81260454185 Concepts and Pr Environments ar es. Hoboken, NJ 13). Wireless monitoring: h Francisco: No Calif: O'Reilly. IS y-IEEE Press. IS	SBN: Exam actices ad : For Starch BN-13: BN-10:
14.	Other additional	.2000								

1.	Name of course:	Embed	bedded Systems												
2.	Code of course:	CSS39	33												
3.	Synopsis:	This co from pr softwar study o integrat	burse introduces the concept of embedded computing and as extension evious microcomputer interfacing course. It also introduces hardware and the issues in embedded computing systems. The course will also include the of the operating platforms, tools and processes used in development and tion of embedded computing system.												
4.	Name(s) of academic staff:	Chang	Wui Lee												
5.	Semester and year of offered	Elective													
6.	Credit value:	3													
7.	Prerequisite/co- requisite (if any):	Succes Commu	ccessful completion of CSS3963 Microcomputer Interfacing, CSS3513 Data mmunication and Networking												
8.	Learning	Program	ramme Educational Objectives (PEO):												
	outcomes:	PEO1	ramme Educational Objectives (PEO): 1 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.												
		PEO2	 science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career. Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement. 												
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.												
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:												
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and												
		PLO2	Apply theoretical principles of computer science in relevant areas, and												
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and												
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and												
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and												
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and												
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and												
		PLO8	Communicate effectively with the computing development community and with the society at large, and												
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.												
		Course	Learning Outcomes (CLO):												

				Upon	comple	etion o	of the	cou	rse, th	ie stu	dent	ts s	hould be able	e to:			
				CLO1	App syst	ly kno em. (0	owled C3, Pl	ge LO1	and u)	Inder	stan	din	g of concep	ots re	elating e	mbedded	
				CLO2	Use skill	relev s in pi	ant te oblen	echn n so	iques Iving.	and o (C3,	demo PLO	ons 94)	strate analytic	cal a	nd critica	l thinking	
			Ī	CLO3	Des	ign er	nbedo	ded	syster	n to ii	mpro	ove	the quality o	of liviı	ng. (C3, F	PLO9)	
9.	Mapping o	of the	Cour	se Lea	arning	Outo	omes	s to	the F	Progr	amn	nin	g Learning	Out	comes, 1	eaching	
	Methods a Course	nd As	Sess F	ment: Program	me Lea	rning C	Outcom	nes (PLO)								
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	D7 PLO	08 PI	_09	Те	eaching Method	ls	Assess	sment	
	CLO1	3										Leo	cture, Tutorial		Progress To Assignmen Final Exam	est, t,, Project ination	
	CLO2				3							Leo	cture, Tutorial		Progress To Assignmen Final Exam	est, t,, Project ination	
		tlo Con	tributio	n: 2 – M	odorato	3 Lecture, Tutorial Project rate Contribution: 3 = Strong Contribution 3 Strong Contribution											
10.	Transferat (if applicat	Probl	em so Skills	olvir	ng and	l scie	ntific	c s	kills; Informa	ition	Manager	ment and					
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:									
	Col	ureo Co	ntont	Outling			Guided Learning			eachir rning	ng an (F2F)	d Lo	earning Activiti Guided	les Inde	ependent	Total	
			incont v	outime				L	т	P	C)	Learning (NF2F)	Le (earning NF2F)	SLT	
	 1. Embedde Design C system The Emb Model Ta 	d Syste Challeng bedded axonom	em Ov ge in er Compu y	erview mbeddec uting Pla	l tform	1		1							1	2	
	2. Introduct • IoT-Enal Technolo • Software	ion to I oling Co ogies e Define	nterne ommun d IoT	t-Of-Thi	ngs	1,2	2	2							2	4	
	3. Introduct (cont.) • Cloud Co • Informati towards	ion to li omputin ion-Cen Efficien	nterne Ig IoT Itric Ne t IoT E	t -Of-Thi tworking	ngs ent	1,2	2	2							2	4	
	4. General-F Architect Datapath Control U Memory Operatio Pipelinin Difference Processo	1,2	2	1	1						2	6					
	 5. Programm Instruction Instruction memory Interrupt Operation specification Lab 	v stem ata og	1,2,	3	1		2					3	8				
	6.Programm (cont.)	ning In	Embeo	dded Sy	stem	1,2,	3	1		2					3	8	

	 Development Environ Flow and tools, Testing and debuggin System performance Lab 	ment: Design g								
	7. Application Specific In Processors (ASIPs) • Microcontrollers • Digital Signal Process • Lab	1,2,3	1		2			3	8	
	8. Peripherals in Embed • Timers • Counters • UART • Other related hardwar • Lab	ded System e	1,2,3	1		2			3	8
	 9. Memory Write ability and stora Memory types Memory hierarchy and Lab 	1,2,3	1		2			3	8	
	10.Interfacing • Communication basic • I/O Addressing • Interrupts • Lab	s between I/O	1,2,3	1		2			3	8
	 11.Interfacing (cont) Advance communicat (Serial, parallel, wirele Lab 	ion principles ess)	1,2,3	1		2			3	8
	12. Control Systems • Open-loop Control Sy • Closed Loop Control S • Lab	stems Systems	1,2,3	1		2			3	8
	 13. Issue in Embedded \$ Current research asso embedded system 	System ociated with	1,2,3	2	2				4	8
	14. Integration of Cloud IoT opportunities and ch	Computing and nallenges.	1,2,3	2	2				4	8
		Tot	al (SLT)	18	5	16	-	-	39	78
	Continues	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							20		4
	2. Assignment							10		10
	3. Project							30		28
	Final As	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination							50		10
		Tot	tal (SLT)		_	_	1	00%		42
								GRAN	D TOTAL SLT	1 20
	L = Lecture, T = Tutorial, P	= Practical, O = O	thers, F2F	= Face	e to Fac	e, NF2F	= Non	Face to Face		
12.	Identify special requirement or resources to deliver the course:	with ser	nsors	sets, A	rduino	uno				
13.	References:	Main reference	ces:							
		Oshana	. R. &	Kraeli	ina. M	(201	9). Sc	oftware Engir	neering for F	mbedded
		System	s, 2nd E	dition.	Newn	es. ISI	BN No	b: 978012809	4488	

		 Armentano, R., Bhadoria, R. S., Chatterjee, P., & Deka, G. C. (2018). The internet of things: foundation for smart cities, ehealth, and ubiquitous computing. Boca Raton, USA: CRC Press. ISBN No.: 9781498789028 Wilmshurst, T. (2010). Designing embedded systems with PIC microcontrollers : principles and applications. 2nd ed. New York: Newnes. ISBN No.: 9781856177504 <u>Additional references:</u> Liyanage. (2020) IoT Security- Advances in Authentication. Wiley. Print. ISBN: 9781119527923
14.	Other additional information:	None.

1.	Name of course:	Machin	e Learning											
2.	Code of course:	CSS39	SS3943											
3.	Synopsis:	This c Intellige algorith	is course provides the students with advanced knowledge of Artificial elligence focus in Machine Learning so that the students are able to apply the gorithm to solve the problems.											
4.	Name(s) of academic staff:	Anli Sh	Sherine											
5.	Semester and year of offered	Elective	tive											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	uccessful completion of CSS3123 Data Structure and Algorithms											
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	O2 Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		Program Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		<u>Course</u> Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	Exp netv	Explain the concepts of biological neural network and artificial neural network models (PLO1, C2)										
				CLO2	Арр	ly a va	ariety	of lea	rning	algor	ithn	ns to different o	lomain data (F	PLO3, C3)		
				CLO3	Solv	e the	proble	ems u	sing	variou	s m	nachine learnin	g techniques(l	PLO4,C3)		
9.	Mapping of Methods a	of the Ind As	Cour	se Lea nent:	arning	Outc	omes	to t	he P	rogra	mn	ning Learning	Outcomes,	Teaching		
	Course		Р	rogram	me Lea	rning C	Outcom	es (PL	.0)	1						
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO	8 PLC	9	Teaching Metho	ds Asses	sment		
	CLO1	3										Lecture, Tutorial	est, t ination			
	CLO2			3								Lecture, Tutorial	Progress T Assignmen Final Exam	est, t ination		
	CLO3				3	0	Progress Test, Lecture, Tutorial Assignment Final Examination									
	Note: $1 = Lit$	ttle Con	tributior	n; 2 = M c	oderate	Contrib	ution; 3	s = Strc	ong Co	ontributi	on					
10.	Transferat (if applical	ole ski ble):	edge;	Practi	cal Sk	tills; F	Proble	em so	lvin	g and scientific	skills.					
11.	Distributio	on of S	Studer	nt Lea	rning ⁻	Time ((SLT)									
									Те	eaching	an	d Learning Activi	ties	T - (- 1		
	Cou	urse Co	ntent C	Outline		CLO	> _ (Guideo	d Lear	ning (F	⁻ 2F)	Guided Learning	Independent Learning	SLT		
								L	Т	Р	C	O (NF2F)	(NF2F)			
	1. Introductio	on to Ma verview rtificial N	achine l of Mac leural n	Learning hine lea etwork (g rning (ANN)	1,2	: :	2	1				3	6		
	2. Classifica • Su • Ra N	tion Me upport v adial B etwork	thods. ector M asis F	lachines unction	(SVM) (RBF)	1,2,	3 2	2	1				3	6		
	2. Classifica • No • D	tion Metearest Netection	thods – leighbo Trees	Cont. ur		1,2,	3 2	2	1				3	6		
	2. Classifica • Lo	tion Me ogistic R arge ma	thods – tegressi rgin Cla	Cont. ion assificati	on	1,2,	3 2	2	1				3	6		
	2. Classifica • Ke • Si • Ti	Classification Methods – Cont. Kernel Methods Support Vector machines Classification and Regression Trace						2	1				3	6		
	3. Graphical • Ba • M	and Se ayesian arkov ra	S	1,2,	3 2	2	1				3	6				
	3. Graphica Cont. • Hi • Le	odels – ers	1,2,	3 :	2	1				3	6					
	4. Clustering • Pa	ring	1,2,	3 2	2	1				3	6					
	 4. Clustering Methods – Cont. Hierarchical Clustering 						3 2	2	1				3	6		
	4. Clustering • Do	g Metho ensity b	ds – co ased Cl	nt. Iustering	J	1,2,	3 2	2	1				3	6		
	5. Neural Ne • Tł	etworks ne Perce	eptron A	Algorithn	n	1,2,	,3 :	2	1				3	6		

	5. Neural Networks – Con • Nonlinear Regr	nt. ession	1,2,3	2	1				3	6				
	5. Neural Networks – Con • Multiclass discr	nt. imination	1,2,3	2	1				3	6				
	5. Neural Networks – Cor • Dimensionality interpretation	reduction	1,2,3	2	1				3	6				
		Tot	al (SLT)	28	14	-	-	-	42	84				
	Continues	Assessment			Total SLT									
	1. Progress Test							20		6				
	2. Assignment							30		15				
	Final As	sessment					Perce	ntage (%)		Total SLT				
	1. Final Examination							50		15				
		Tot	al (SLT)				1	00%		36				
	L Lastura T. Tutarial D	Drastiaal Q. Q		- -	. to F ac		Ner	GRAN	ID TOTAL SLT	1 20				
12.	requirement or resources to deliver the course:	Python's IDE	Ξ											
13.	Main references: • Gallier Jean H & Quaintance Jocelyn. (2020) Linear Algebra And Optimization With Applications To Machine Learning - Volume II Fundamentals Of Optimization Theory With Applications To Machine Learning. World Scientific. ISBN: 9789811216572 Additional references: • Flach, P.(2019). Machine Learning: the art and science of algorithms tha make sense of data. Cambridge New York: Cambridge University Press ISBN: 9781107422223 • Du, K.L & Swamy M.(2014). Neural networks and statistical learning													
14.	Other additional information:	None												

1.	Name of course:	Data M	ining											
2.	Code of course:	CSS39	sta mining SS3953											
3.	Synopsis:	This co paradig or larg machin to perfo	his course provides the students with knowledge of algorithms and computational aradigms that allow the computer to find patterns and regularities in databases large datasets by using selection, cleaning, coding, pattern recognition, achine learning and other statistical methods, so that the computer can be used perform forecasting and improve the performance of interactions. hew Kim Mey ective											
4.	Name(s) of academic staff:	Chew k												
5.	Semester and year of offered	Elective												
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3233 Statistics											
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Progran</u> Upon c	<u>mme Learning Outcomes (PLO):</u> ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to Software Engineering											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale software system											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the software system development community and with the society at large											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development											
		Course	Learning Outcomes (CLO):											

				Upon	Jpon completion of the course, the students should be able to:										
				CLO1	Rev (C3	vise th , PLO	e cono 1)	cept o	f data	war	eho	uses and online	e analytic pro	cessing	
				CLO2	Cor (C6	struct , PLO	techr 4)	iques	for p	re-pr	oce	essing data and	concept desc	ription	
				CLO3	Per clas	form e sificat	efficier tion, p	ntly me redicti	ethod on, a	s for nd cl	mir uste	ning association er analysis (C3,	rules, data PLO8)		
9.	Mapping o Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	comes	s to th	Outcomes,	Feaching					
	Course		F	rogram	me Lea	rning (Outcom	es (PL	0)						
	Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PL07	PLO8	PLC	99	Teaching Method	ls Asses	sment	
	CLO1	3										Lecture, Tutorial	Progress T Final Exam	est, ination	
	CLO2				3							Lecture, Tutori Practical, Compute based Learning	al, er- Progress T	t, est	
	CLO3								2			Practical, Compute based Learning	er- Assignmen Final Exam	t, ination	
	Note: 1 = Lit	tle Con	tributio	n; 2 = M	oderate	Contrik	oution; 3	s = Strop	ng Cor	ntributi	on				
10.	Transferat (if applicat	Knowl Respo	edge; onsibili	Pro ties	blem	Solv	ing	and	S	cientific Skills;	Social SI	kills and			
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:							
									Tea	ching	j an	d Learning Activiti	es	Tatal	
	Coι	irse Co	ntent	Outline		CL	0	Guided	Learr T	P	-2F)	Guided Learning	Independent Learning	SLT	
	1. Introduct	ion to [Data M	ining				-		•		(NF2F)	(NFZF)		
	Purpose The lase	of Data	Mining	g A Minima											
	Definition	onance n of Dat	a Minir	a iviining 10				-	_						
	The Data	a Involv	ed	-9		1,2	2	2	2				4	8	
	Data Mir	ning Fur	nctiona	lities											
	Major Iss	sues in	Data N	lining Sy	stems										
	2. Data War	ehouse	and C	DLAP											
	Technologi	es for D	Data Mi	ining											
	A Multi-E	n or Dat Dimensi	a ware onal Da	enouse ata Mode	el										
	 Data Wa 	rehous	e Archi	tecture		1,2	2	2	2				4	8	
	Further [Technold	Develop	ment c	of Data C	ube										
	 From Date 	ita Ware	ehousir	ng to Dat	a										
	Mining	D #4444													
	Reasons	to Pre-	Proces	ss the Da	ata										
	Data Cle	aning						-							
	Data Inte Data Re	egration	and T	ransform	ation	1,2	,3	2					2	4	
	Data Re Data Re Data Re	ation ar	nd Con	cept Hie	rarchy										
	Generati	on			-										
	4. Data Pre-	Proces	sing -	cont.											
	 Data Re Discretiz 	ation ar	nd Con	cept		1,2	,3	2		2			4	8	
	 Hierarch 	y Gene	ration	•											

 5. Concept Description What is Concept Description Data Generalization and Summarization-Based Characterization Analytical Characterization: Analysis of Attribute Relevance 	1,2,3	2				2	4
 6. Concept Description (cont.) Mining Class Comparisons: Discriminating Between Different Classes 	1,2,3	2	2			4	8
 7. Mining Association Rules in Large Database Association Rule Mining Mining Single-Dimensional Boolean Association Rules from Transactional Databases Mining Multi-Level Association Rules from Transactional Databases 	1,2,3	2				2	4
 8. Mining Association Rules in Large Database (cont.) Mining Dimensional Association Rules from Relational Databases and Data Warehouses From Association Mining to Correlation Analysis Constraint-Based Association Mining 	1,2,3	2		2		4	8
 9. Classification and Prediction Classification and Prediction Issues Regarding Classification and Prediction Classification by Decision Tree Induction Bayesian Classification Classification by Back Propagation 	1,2,3	2		2		4	8
 10. Classification and Prediction (cont) Classification Based on Concepts from Association Rule Mining Other Classification Methods Prediction Classifier Accuracy 	1,2,3	2		2		4	8
 11. Cluster Analysis Introduction to Cluster Analysis Types of Data in Cluster Analysis A Categorisation of Major Clustering Methods 	1,2,3	2				2	4
12. Cluster Analysis • Partitioning Methods • Density-Based Methods • Model-Based Clustering methods • Outlier Analysis Practical	1,2,3	2		2		4	8
 Mining, Complex Types of Data Multi-Dimensional Analysis and Descriptive Mining of Complex Data Objects Mining Spatial Databases Mining Multimedia Databases Mining Time-Series and Sequence Data Mining Text Databases Mining the World Wide Web 	1,2,3	2				2	4
14. Applications and Trends in DataMiningData Mining Applications	1,2,3	2				2	4

	 Data Mining System F Prototypes Additional Themes on Social Impacts of Data Trends in Data Mining 	Products and n Data Mining a Mining								
		Tot	al (SLT)	28	6	10			44	88
	Continues	Assessment				Total SLT				
	1. Progress Test							20		6
	2. Assignment				16 Tatal					
	Final As	sessment			SLT					
	1. Final Examination							40		10
		Tot	al (SLT)				1	00%		32
	L = Lecture, T = Tutorial, P	= Practical, $O = O$	thers, F2F	= Face	to Face	NF2F	= Non	GRAM Face to Face	ND TOTAL SLT	1 20
12.	Identify special requirement or resources to deliver the course:	none								
13.	References:	Main reference Pang-Ning (2019).Int 01331289 Liam Da Comprehe 3rd Editional ref Mohamme Learning: 11084739 Herbert Ja Collection Publishing	<u>ces:</u> g Tan, roductio 001 amien ensive L n, ISBN <u>erences</u> ed J. Z Funda 089. Car ones .(2 , and E g Platfor	, Mic on to (2019) Jnders I-13 : { aki , \ amenta nbridg 2018)./ Busines m (Se	hael Data . DA tandin 978-11 Wagne al Co e Univ Analytic ss Inte ptemb	Stein Mining TA N g of D 08476 er Mei encepts ersity cs for elligen er 19,	bach, g. Pe /IININ Data N 3348 ra Jr s an Press Busin ce Co 2018	Anuj Kar arson Educa G: Your U Iining, Camb (2020). Data d Algorithm s; 2nd Edition less, Data Mi oncepts. Crea). ISBN-13 : S	patne, Vipin ation, Inc. ISB Iltimate Guid ridge Universi a Mining and ns. ISBN-13 (March 12, 20 ining Techniqu ateSpace Inde 978-17274810	Kumar 3N: 978- le to a ity Press; Machine : 978- 020) ues, Data ependent 13
14.	Other additional information:	None								

1.	Name of course:	Microco	rocomputer Interfacing											
2.	Code of course:	CSS396	SS3963											
3.	Synopsis:	This con critical t Analysis part of t	his course describes in practical terms how to program a PC to carry out time ritical tasks, to sense real-world quantities such as temperature, sound, light etc. nalysis of data acquired, display the results and performing control tasks are also art of the course.											
4.	Name(s) of academic staff:	Chang \	ng Wui Lee											
5.	Semester and year of offered	Elective	ctive											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes	sful completion of CSS3523 Computer Architecture											
8.	Learning	Program	nme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		Program Upon co	nme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large- scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		Course Upon co	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	Exp	Explain the concepts of microprocessor hardware interfacing. (C2, PLO1)											
				CLO2	Us skil	e relev Ils in p	/ant te robler	chnic n solv	lues /ing.	and d (C3, I	lem PLC	ions D4)	strate analyti	cal and critica	Il thinking		
				CLO3	Construct a program for microcomputer interfacing for improving lifestyle. (C3, PLO9)												
9.	Mapping o Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	omes	s to t	he P	rogra	mr	nin	g Learning	Outcomes, 1	Feaching		
	Course		P	rogram	me Lea	rning (Outcom	es (PL	.0)								
	Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	98 PL	09	Те	eaching Method	ls Assess	Assessment		
	CLO1	3										Le	cturer, Tutorial	Progress T Assignmen Final Exam	est t ination		
	CLO2				3							Le	cturer, Tutorial	Progress T Assignmen Project Final Exam	est t		
	CLO4									3	3	Le	cturer, Tutorial	Project	mation		
	Note: $1 = l$ if	tle Con	tributio	n; 2 = Ma	oderate	Contrib	oution: 3	B = Stro	na Cr	ontribut	ion						
10.	Transferat (if applicat	ole ski ole):	lls	Knowl Lifelor	edge; ng Lea	Probl	em so Skills.	olving	and	scier	ntifi	c s	kills; Informa	tion Manager	ment and		
11.	Distributio	Time	(SLT)	:													
									Τε	achin	g an	d L	earning Activiti	es	Total		
	Coι	irse Co	ntent (Dutline		CLO	0	Guideo L	d Lear T	ning (P	F2F)) ว	Guided Learning (NF2F)	Independent Learning (NF2F)	SLT		
	1. Software and 8086 • Micropro	archite	cture o	of the 80)88	1,2	2	2						1	3		
	2. Software and 8086 (C • Memory	archite ont.) address	cture o	of the 80	88	1,2	2	2						1	3		
	3. AssemblyInteger in	y langu	age pro	ogramm	ning	1,2	2	1	1					2	4		
	4.Assembly (Cont) • Control f	langua low inst	age pro	o gramm s	ing	1,2	2	1	1					2	4		
	5. Assembly (Cont) • Control f	y langu low inst	age pro	ogramm s	ning	1,2	2	2		1				3	6		
	 6. Machine Assemblusing the software 	languag ly langu e DEBU for IBN	ge cod age de G I PC	ing velopme	ent	1,2,	,3	2		1				3	6		
	7. Machine language coding (cont.) • Assembly language development using MASM						,3	2		1				3	6		
	8. Input/Out programmin 8255 pro- interface 8254 pro- 8259A pro- controlle	p ut intense ogramm ogramm rogramm r	erface able pe able int mable i	circuit eripheral terval tim nterrupt	ner	1,2,	,3	1	1					2	4		
	9. Input/Out programmin • 8254 pro	put inten ng (Con ogramm	erface it.) able inf	circuit terval tim	ner	1,2,	,3	1		2				3	6		
	10.Input/Ou programmii	tput int ng (Con		1,2,	,3	1		2				3	6				
	8259A programmable controller	interrupt															
-----	---	---	-------------------------------	--	-----------------	------------------	------------------	-------------------------	----------------------	----------	--	--	--				
	11. Input/Output interfac programming (cont) • 8259A programmable controller	e circuit	1,2,3	1		2			3	6							
	 12. Signal conversion conversion conversion Analog-to-Digital conversion 	oncepts /ersion	1,2,3	1	1	1			3	6							
	 13. Signal conversion conversion conversion Analog-to-Digital conversion 	oncepts (cont) /ersion	1,2,3	1	1	1			3	6							
	 14. Signal conversion conversion conversion Analog-to-Digital conversion 	oncepts (cont) /ersion	1,2,3	1	1	1			3	6							
		Tot	tal (SLT)	19	6	12	-	-	35	72							
	Continues		Percentage (%)														
	1. Progress Test	1. Progress Test						10		4							
	2. Assignment	2. Assignment						20		12							
	3. Project			30													
	Final As	sessment		Percentage (%)													
	1. Final Examination							40		10							
		Tot	tal (SLT)				1	00%		48							
	L – Lecture, T – Tutorial, P	- Practical O - O	there E2E	GRAND TOTAL SLT 12 2F = Face to Face, NF2F = Non Face to Face													
			11613, 1 21	- 1 ace		6, INI 21	= 10011										
12.	Identify special requirement or resources to deliver the course:	ESA 86 Elect	tronic Ki	ts.													
13.	References:	 <u>Main references:</u> Gerard Prudhomme. (2018) Introduction to Assembly Language Programming. Arcler Education Inc, Canada. Print. ISBN: 9781773614700 Prudhomme, G.I. (2017) Microcomputer Architecture and Programming. Arcler Press LLC. Print. ISBN: 978-1680944662 <u>Additional references:</u> Nilesh B.B. (2010) Microprocessors: The 8086/8088, 80186/80286, 80386/80486 And The Pentium Family ISBN: 8120339428 															
		Additional ref • Nilesh E 80386/80	erences 3.B. (2 486 Anc	<u>::</u> 010) I The F	Micro Pentiu	proces m Farr	sors: ily. IS	The 8086 BN: 8120339	5/8088, 8018 9428	86/80286							

1.	Name of course:	System	em and Network Programming											
2.	Code of course:	CSS39	3973 course is focus on network programming with some common											
3.	Synopsis:	This c techniq coverec process	course is focus on network programming with some common ues/technologies and tools that are available currently. Topics that will be d include network development environment, development tools, thread, s,IPC and network programming.											
4.	Name(s) of academic staff:	Khairur	nnisa Ibrahim											
5.	Semester and year of offered	Elective	ctive											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes Operati	sful completion of CSS3123 Data Structure and Algorithms, and CSS3533 ing Systems											
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	O1 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		<u>Prograr</u> Upon c	mme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		Course	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	Eva com fund	valuate between process and thread with their inter process communication and control and interact with system through system unction calls. (C5, PLO1)										
				CLO2	Des both	sign th n Unix	ie soc and V	ket Vind	progr ows l	amm base	ning d sys	ano ster	d develop sy n. (C6, PLO2	stem level p 2)	rogram in	
				CLO3	Eva	luate	syster	n lev	/el co	mpoi	nents	s ai	nd its functior	ns. (C5, PLO	4)	
				CLO4	Coc	operate gram i	e to s n both	etup n Un	the ix and	sock d Wir	et pr ndow	rogi /s b	ramming and ased system	l develop sys . (C6, PLO6)	tem level	
9.	Mapping o Methods a	of the nd As	Cour	se Lea ment:	arning	Outo	omes	s to	the F	Prog	ramr	min	g Learning	Outcomes,	Teaching	
	Course		F	Program	me Lea	rning C	Outcom	nes (F	PLO)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO	7 PL	08 P	PLO9	Τe	eaching Method	ls Asses	Assessment	
	CLO1	3										Lecture, Assignment, Practical		Progres Assigi Final Exa	ss Test, nment mination	
	CLO2		3										Lecture, Assignment, Practical	Progres Assigi Final Exa	Progress Test, Assignment Final Examination	
	CLO3				3								Assignment, Practical	Progres Assigi Final Exa	ss Test, nment mination	
	CLO4						3						Assignment, Practical	Progres Assigi Final Exa	ss Test, nment mination	
10.	Transferat (if applicat	ole ski ole):	lls	Knowl and To	edge; eam S	Probl kills	em S	olvir	ig an	d Sc	ienti	fic	Skills; Comn	nunication, L	eadership	
11.	Distributio	n of S	tude	nt Lea	rning	Time	(SLT)	:								
						Teaching and Learning Activities										
	Cou	ırse Co	ntent	Outline		CLO Guided Learning (F2F) Guided In						Independent	Total SI T			
							l	L	т	Р	C	0	(NF2F)	(NF2F)	•=-	
	 Introduction to System Programming Introduction to Linux General concept and utilities Linux basic command C programming revised Linux Development Tools Linux advanced utilities Linux System Programming introduction Command language 					3		2		2				2	6	
	 2. File and File I/O File hierarchy Concept of i-node Introduction to file system File internal structure File handling commands 					3		2		2				2	6	
	 3. Fundamental File Access and management File descriptor File system call (open, access, permission, close, read, write, create, error) File random access and pointer 					3		2		2				2	6	

 4. Process Management (part 1) Job controls Process command Concept of program Concept of process Process operation, hierarchy, states, composition, scheduling and API 	3	2		2		2	6
 5. Process Management (part 2) Process relationship Create process Terminate process Suspend process 	3	2		2		2	6
 6. Signal Learn the fundamentals of signal handling Experiment with signals for control Explore the POSIX signal facilities Use signal masks and handlers 	3	2		2		2	6
 7. Inter-process communication Introduction to IPC Types of IPC Pipes Multiple Pipes (PIPE, FIFO) Rule for read and write for PIPE Fork and PIPE system call 	2,4	2		2		2	6
8. Advance Inter-process communicationShared memoryMessage queueSemaphores	2,4	2	2			2	6
 9. Introduction to Network Programming /Socket programing (part 1) The client and server model Using client-server application User information and communication 	2,4	2	2			2	6
 10. Introduction to Network Programming /Socket programing (part 2) Communication channels Types of transmission Connection oriented model Connectionless oriented model 	2,4	2	2			2	6
 11. Introduction to Network Programming /Socket programing (part 3) Introduction to sockets Sockets perspective at client side Sockets perspective at server side 	2,4	2		2		2	6
 12. Thread Programming/Shell Programming (part 1) Process vs thread Concept of sharing-thread Benefit of thread vs processes Benefit of multithreading 	2,4	2	2			2	6
 13. Thread Programming/Shell Programming (part 2) Thread programming perspective Thread libraries POSIX threads-pthreads Race condition and mutex Deadlock Shell Programming 	1,2,4	2	2			2	6

	 14. Thread Programming/ Programming (part 3) Types of Shell Creation of Shell Scrip Customization of Shell System Programming Alternatives of system windows environment 	Shell ot in Window programming in	2		2			2	6
		Total (SLT)	28	10	18			28	84
	Continues	Assessment		I		Perce	ntage (%)	•	Total SLT
	1. Progress Test			4					
	2. Assignment			20					
	3. Presentation						10		2
	Final Ass	sessment				Perce	ntage (%)		Total SLT
	1. Final Examination						50		10
		Total SLT		36					
	L – Locturo, T – Tutorial, P	- Practical O - Others E2		to Fac			GRAN	ND TOTAL SLT	120
12.	Identify special requirement or resources to deliver the course: References:	None <u>Main references supp</u> Van Winkle, L. (2 programming in Publishing Ltd. IS <u>Additional references</u> W. Richard Stev Programming: 7 Professional. ISE Fall, K. & Steve Addison-Wesley McKellar, J. & F Farnham: O'Reill	oorting 2019). <i>C ar</i> SBN: 9 ens, E <i>The so</i> 3N: 97 ns, W . ISBN ettig, y. ISB	the co Hands of write 78178 3ill Fer 5ckets 80131 . (2012 -13: 9 A. (20 N-13: 9	Durse: -On N e sect 393440 41155 2). TC 78-032 13). T 978-14	letwor ure a 080 Andrev orking 55 ?P/IP 1 21336 Twiste 14932	k Programmi nd optimized M M. Rudoff. API, Volun Illustrated. Up 316 d network pr 6111	ng with C: Lea I network cod (2004). UNIX ne 1. Addiso oper Saddle F rogramming e	arn socket de. Packt (<i>Network</i> n-Wesley River, NJ: ssentials.
14.	Other additional information:	None							

1.	Name of course:	Wireles	ess Mobile Networking											
2.	Code of course:	CSS39	83											
3.	Synopsis:	This co on wire and its A+ cert	urse provide an in depth study of wireless mobile networking focus mainly less mobile computing and networking as well as mobility of the devices implications at all network layers that will fulfill the requirement of CompTIA ification											
4.	Name(s) of academic staff:	Khairur	inisa Ibrahim											
5.	Semester and year of offered	Elective												
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	Succes Commu	uccessful completion of CSS3533 Operating Systems, CSS3513 Data communication and Networking											
8.	Learning	Program	nme Educational Objectives (PEO):											
	outcomes:	PEO1	O1 Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	Graduates will pursue lifelong learning in order to contribute to the advancement of information technology and computer science professions and related competency issues.											
		Program Upon co	nme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											
		Course Upon c	Learning Outcomes (CLO): ompletion of the course, the students should be able to:											

				CLO1	Des of s	Design the application of wireless and mobile network in different type of scenario (C6, PLO1)										
				CLO2	Des diff	ign, c erent i	leploy equire	and and	trou ts (C	ıblesh 6, PL	oot O2)	wireless and	mobil	le netwo	orks with	
				CLO3	Just sear	ify th	e imp comm	oortar unica	ice o ition	of win (C5,]	eles PLO	s and mobile (5)	netw	ork in j	providing	
9.	Mapping of Methods a	of the nd As	Cour	se Lea	arning	Outo	omes	to t	he P	rogra	ımm	ning Learning	Outc	omes, 1	Feaching	
	Course		F	Program	me Lea	rning C	Outcom	es (Pl	.0)							
	Learning Outcomes (CLO)	PL01	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO	08 PLO	09	Teaching Metho	ods	Assessment		
	CLO1	3										Lecture, Tutorial & Lab	δ P Α Ε	Progress Tr Assignmen Exam	est, t, Final	
	CLO2							1	Lecture, Tutorial & Lab	& P A E	Progress To ssignmen xam	est, t, Final				
	CLO3					3						Lecture, Tutorial & Lab	β P Α Ε	Progress To ssignmen xam	est, t, Final	
	Note: 1 = Lit	tle Con	tributio	n; 2 = Ma	oderate	Contrib	ution; 3	s = Stro	ong Co	ontribut	ion					
10.	Transferat (if applicat	edge;	Value	, Attitu	ldes	and F	Profes	ssion	nalism							
11.	Distribution of Student Learning Time (SLT):															
	Teaching and Learning Activities															
	Cou	ırse Co	ntent	Outline		CLO	о <u>(</u>	Guide	d Lear	rning (F2F)	Guided	Inde	pendent arning	Total SLT	
								L	Т	Ρ	0	(NF2F)	(N	IF2F)		
	1.Introducti Communica History a Introduct History a Types of Systems Applicati	on to W ations a and chal tion to V and Dev Wireles ons of V	Vireles Ind Ne Ilenges Vireles elopme ss Com Vireles	s tworks s Networ ent municat s Systen	ks ion n	1,2	2 2	2	1					3	6	
	2. Wireless API Free Sharing Transmit	transm quency: tting and	ission Spectr d Rece	fundam um and iving	entals	1,2	2	2	1					3	6	
	3. Wireless -cont. . Cells and . Signal ar	entals	1,2	2 2	2	1					3	6				
	4. Cellular N 2G: GSM 2.5G: GF 3G: CDM LTE 5G	1,2	2	2	1					3	6					
	 5. Wireless MANs Concepts and Architecture Broadband Access Technology WiMax: IEEE 802.16 					1,2	2	2		1				3	6	
	6. WirelessInfraredInfrastruct	Windx, IEEE 022.10 Windx, IEEE 022.10 Windx, IEEE 022.10 Infrared vs. Radio Transmissions Infrastructure vs. Ad-hoc Networks						2	1					3	6	

То	tal (SLT)								
1. Final Examination						40		10	
Final Assessment		Percentage (%)							
2. Assignment						40		22	
1. Progress Test						20		4	
Continues Assessment					Percer	ntage (%)		SL	
То	28	10	4	-	-	42	84 Tot:		
14. Issues in mobile and wireless networks • VPN • Challenges	1,2	2	1				3	6	
 IR RFID Bluetooth 802.11 	1,2	2	1				3	6	
13. Technologies that facilitate IoT . Z-Wave . Ant+ . NFC									
 12. Configuring basic mobile device network connectivity - cont. Integrated commercial provider email configuration: iCloud, Google, Exchange Online PRI updates/ PRL updates/ baseband updates Radio firmware IMEI vs IMSI 	1,2	2		1			3	6	
 11. Configuring basic mobile device network connectivity Hotspot Tethering Bluetooth ISP email configuration 	1,2	2	1				3	6	
 10. Configuring SOHO firewall DMZ Port forwarding NAT Encryption Channels MAC filtering 	1,2	2		1			3	6	
 9. Wireless SOHO network Router/switch functionality Access point settings IP addressing IoT device configuration 	1,2	2		1			3	6	
 8. Wireless LANs – cont. Other IEEE 802.11 standards: IEEE 802.11b, IEEE 802.11a/g, IEEE 802.11ac Frequencies - 2.4Ghz, 5Ghz 	1,2	2	1				3	6	
IEEE 802.11: Architecture, MAC Layer, Synchronization, Power Management, Roaming	1,2	2	1				3	6	

12.	Identify special requirement or resources to deliver the course:	Mobile network equipment and CRACK lab
13.	References:	 Main references: CompTIA A+ Core 1 Exam: Guide to Computing Infrastructure. (2020) Cengage Asia. ISBN: 9780357108376 CompTIA A+ Core 2 Exam: Guide to Operating Systems and Security. (2020) Cengage Asia. ISBN: 9780357108505 CompTIA Network+® Deluxe Study Guide. (2018) Wiley Publishing, Inc., Indianapolis, Indiana. ISBN: 9780470427484 Miller, M. (2012). Wireless Networking Absolute Beginner's Guide. Que Publishing. ISBN-10: 0789750783 Additional references: Wrightson, T. (2012). Wireless Network Security A Beginner's Guide. New York: McGraw-Hill Osborne Media. ISBN-10: 0071760946 Lowe, D. (2012). Networking All-in-One For Dummies. Hoboken, NJ: For Dummies. ISBN-10: 1118380983 Burbank, J., Andrusko, J., Everett, J., Kasch, T. (2013). Wireless Networking: Understanding Internetworking Challenges. Pistacaway, NJ: Wileey-IEEE Press. ISBN-10: 1118122380 Gast, M. (2013). 802.11ac: A Survival Guide. Sebastopol, CA: O' Reilley Media. ISBN-10: 1449343147.
14.	Other additional information:	None

1.	Name of course:	Digital I	ital Marketing											
2.	Code of course:	CSS39	93											
3.	Synopsis:	The pro organiz insights and an reach t develop	bliferation of social media, smartphones and Internet-of-Things have given bliferations access to Big Data which allows them to gain better hind-sights, and foresights on their fields of interest. This course covers data capture alysis tools, methodologies and strategies to enable one to identify and argeted communities, understand online behaviors, build influences and b deep customer and user relationships.											
4.	Name(s) of academic staff:	Marcell	larcella Peter											
5.	Semester and year of offered	Elective	Elective											
6.	Credit value:	3												
7.	Prerequisite/co- requisite (if any):	None												
8.	Learning	Program	mme Educational Objectives (PEO):											
	outcomes:	PEO1	Graduates will be employed or self-employed in relevant computer science field with good level of knowledge and competency skills with appropriate attitude enabling them to have successful career.											
		PEO2	O2 Graduates will acquire abilities for effective communication, collaborative working in diverse teams, and continual development through professional involvement.											
		PEO3	2EO3 Graduates will pursue lifelong learning in order to contribute to advancement of information technology and computer scie professions and related competency issues.											
		<u>Prograr</u> Upon c	nme Learning Outcomes (PLO): ompletion of the programme, the graduates should be able to:											
		PLO1	Apply knowledge and understanding of essential facts, concepts, principles, skills, and theories relating to computer science, and											
		PLO2	Apply theoretical principles of computer science in relevant areas, and											
		PLO3	Demonstrate appropriate methodologies, models, techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance, and documentation of a large-scale computing solution, and											
		PLO4	Use relevant techniques and demonstrate analytical and critical thinking skills in problem solving, and											
		PLO5	Conduct professional and ethical responsibilities in accordance with ethical and legal principles, and											
		PLO6	Function effectively both as individuals and in a group in the capacity of a leader or a team member, and											
		PLO7	Apply broad business and real world perspectives daily and demonstrate entrepreneurship skills related to computer science practice, and											
		PLO8	Communicate effectively with the computing development community and with the society at large, and											
		PLO9	Apply skills and principles of lifelong learning in both academic and career development.											

	Course Learning Outcomes (CLO):														
				Upon	compl	etion (of the	cours	e, the	stude	ents	should be abl	e to:		
				CLO1	App onli	oly dig ne coi	ital too mmun	ols to (ities' b	gain b behav	etter iors, s	hind senti	-sights, insigh ments and ne	ts and foresig eds (PLO3, C	ghts on C3)	
			-	CLO2	Eva (PL	luate 07, C	digita 5)	al con	sume	rism,	cor	sumption an	d engageme	ent levels	
			-	CLO3	Dev	elop	digital	mark	eting	strat	tegie 4 Cf	s, objectives,	plans and	campaign	
9.	Mapping o	of the	Cour	se Lea	arning	Outo	comes	s to th	ne Pr	ograi	nmii	ng Learning	Outcomes,	Feaching	
		nu As	P	Program	melea	rnina (Outcom	nes (Pl	0)						
	Learning Outcomes	PLO1	PLO2	PLO3	PLO4	PLO5	PLO5 PLO6 PLO7 PLO8 PLO9				, т	eaching Method	ls Asses	sment	
	CLO1 3										Le	ectures, Tutoria nline Practical.	ls, Quizzes, Presentatio Progress T Exam	on, Test, Final	
	CLO2							3			Le Oi	ectures, Tutoria nline Practical.	ls, Quizzes, Presentatic Project, Fir	on, nal Exam	
	CLO3 3										Le	Lectures, Tutorials, Quizzes, Online Practical. Presentation, Ca Study, Project, Fi Exam			
	Note: 1 = Lit	tle Con	tributior	$n; 2 = M_0$	oderate	Contrib	oution; 3	B = Strop	ng Cor	tributio	on				
40															
10.	(if applicat	ole ski ole):	IIS	Entrep	cal S preneu	kills; irial Sl	Prob kills	lem :	Solvir	ig a	nd	Scientific Sk	ills; Manage	erial and	
11.	Distributio	n of S	Stude	nt Lea	rning	Time	(SLT)	:							
									Теа	ching	and L	_earning Activiti	es		
	Col	ırse Co	ntent C	Dutline		CL	o	Guided Learni			2F)	Guided	Independent	Total SLT	
								L	т	Р	0	(NF2F)	(NF2F)		
	1. The Digita • Digital	al Marke Disrupt	eting La ion	Indscape	e	1.0	2	2	~				2	_	
	 Digital Interne Bitcoin 	et of Thi and Bl	, ngs & E ockcha	Big Data in		1,2	,5	2	2				Z	0	
	Bitcoin and Blockchain Sitcoin and Blockchain Sitcoin and Blockchain Sitcoin and Blockchain Evolution of the Digital Consumer Changing Digital Behaviour Online Customer Journey					1,2	,3	2	2				2	6	
	 3. The Digital Marketing Toolbox The Evolution of digital Marketing Email, Websites, Online PR, Search Engines, Blogs, Social Networks Social Media Advertising 					1,2	,3	2	1	1		1	1	6	
	 4. Content Marketing Content Marketing Strategy Content Management Best Principles for Content Marketing 					1,2	,3	2	1	1		1	1	6	
	 5. Online Communities The Development of Online Communities The Roles of the Organization Managing Online Communities 					1,2	,3	2	2		_		2	6	

	 6. Mobile Marketing The Mobile Ecosyst Mobile Advertising, Business, Mobile Se Geo-Marketing and Codes, SMS Text M 	em Mobile Apps for earch Beacons, QR lessages	1,2,3	2	1	1		2		6
	 7. Augmented, Virtual and Computer-Mediated Theories Application of Difference 	I Mixed Reality Communication ent Realities	1,2,3	2	2			2		6
	 8. Audit Frameworks Digital Marketing Au Customer Insights 8 Review Macro-environment 	1,2,3	2	2				2	6	
	 9. Strategy and Objectives Strategy and Tactics Digital Strategy Mode Marketing Mix Object 	1,2,3	2	2				2	6	
	 10. Building the Digital Ma Building the Plan Resource Planning Assembling the Plan 	1,2,3	2	2				2	6	
	 11. Social Media Managei Types of social Media Social Media Adopti Implementation Tools for Managing 	1,2,3	2	2	2		2		8	
	 12. Managing Resources Digital Marketing Hu Roles and Responsi Groups 	 12. Managing Resources Digital Marketing Human Resources Roles and Responsibilities in Groups 							2	6
	 13. Digital Marketing Metr and Reporting Digital Marketing Met Analytics for Web, E Social Media, Searc Marketing & PPC Ar Extracting & Reporti 	 13. Digital Marketing Metrics, Analytics and Reporting Digital Marketing Metrics Analytics for Web, Email, Content, Social Media, Search Engine Marketing & PPC Analytics 						2		8
	 14. Integrating, Improving Transforming Digital Mark The 4Cs of Cross-P Integration Improve Digital Mark Capabilities & Taction Beyond Digital Transition 	• Extracting & Reporting the Data 14. Integrating, Improving and Transforming Digital Marketing • The 4Cs of Cross-Platform Integration • Improve Digital Marketing Capabilities & Tactics • Beyond Digital Transformation							2	6
		Tot	al (SLT)	28	3	9		10	18	88
	Continues	Assessment					Percer	ntage (%)		Total SLT
	1. Progress Test							10		4
	2. Assignment							40		16
	3. Presentation							10		2
	Final Ass	sessment					Percer	ntage (%)		Total SLT
	1. Final Examination	1. Final Examination						40		10
		al (SLT)				1(00%		32	
	L - Lecture T - Tutorial D	there Eor	- 5000	to Fact		- Non	GRAN	D TOTAL SLT	1 20	
12.	Identify special requirement or resources to deliver the course:	alytics,	Goog	le Ana	lytics.					

13.	References:	 <u>Main references:</u> Hanlon, A. (2019). Digital Marketing: Strategic Planning & Integration. Sage Publications. ISBN-13: 978-1526426666 Hemann, C. & Burbary, K. (2018). Digital Marketing Analytics: Making Sense of Consumer Data in a Digital World. Pearson. ISBN-13: 978-0-7897-5960-3 Kingsnorth, S. (2019). Digital Marketing Strategy: An Integrated Approach to Online Marketing. Kogan Page Ltd. ISBN-13: 978-0749498085 <u>Additional references:</u> Chaffey, D. & Ellis-Chadwick, F. (2019). Digital Marketing: Strategy, Implementation and Practice. Pearson. ISBN-13: 978-1292241579 Diamond, S. (2019). Digital Marketing All-In-One for Dummies. John Wiley & Sons Inc. ISBN-13: 978-1119560234
14.	Other additional information:	None