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Mathematical Sciences	Version: 3.0
Faculty of Science	Date of Amendment: 2/08/18
Course: SSCM 1023 – Mathematical Methods I	Semester: I
Total Lecture Hours: 42 hours	Academic Session: 2018/2019

Lecturer	:	<u>Lecturer</u>	Tel	Room	Programme/	<u>e-mail</u>
			No	No	<u>Section</u>	
		Dr Fuaada Mohd	34224	C22	Section	fuaada@utm.my
		Siam (C)		424	1,4,12	
		Tn. Hj Ismail	34286/	C13		ismailkamis@utm.my
		Kamis	34003	323		
		Assoc. Prof. Dr	34275	C22		normuhainiah@utm.my
		Nor Muhainiah		418		
		Mohd Ali				
		Assoc. Prof. Dr				rohanin@utm.my
		Rohanin Ahmad				
		Dr Shazirawati	34240	C22	Section 11,	shazirawati@utm.my
		Mohd Puzi		419		
Synopsis	:	Pre-requites: NIL				
		The course revises	and exte	nds Mat	riculation and	STPM topics such as
		differentiation and	integrati	on towa	rds hyperbolic	and trigonometric inverses.
		Applications in com	puting a	rc length	n and area of s	urfaces of revolution are also
		included. Other top	oics cover	red are i	mproper integ	rals, parametric equations,
		polar coordinates, a	and mult	ivariable	functions. Thi	is later topic serves as an
		introduction to three	ee dimen	sional ca	alculus which s	students will learn in
		Mathematical Meth	nods II. T	he chapt	er will merely	devoted to sketching
		surfaces and finding limits of two variable functions. It is hoped that upon				
		completion of the course, students should have acquired some firm basic tools				
		to pursue further mathematics.				

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Name: Dr Fuaada Mohd Siam	Name:
(Coordinator)	Signature:
Signature:	Date:
Date:2 August 2018	

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Learning Outcomes

By the end of the course, students should be able to:

No.	Course Learning Outcomes	Programme Learning Outcome(s) Addressed	Taxonomies (C, P, A)	Weightage (%)	Assessment Methods	
	Convert polar coordinates to Cartesian and vice versa, convert parametric and polar	PLO1	C2	15	Quiz (3%)	
CLO1	equations to Cartesian and vice versa, and sketch parametric and polar equations.	PLO2	СЗ	4	Test (8%), Final Exam (8%)	
	Sketch graphs of hyperbolic and trigonometric inverses.	PLO1	C2	7	Assignment (3%),	
CLO2	and prove some identities related to these functions.	PLO2	С3	7	Test (7%), Final Exam (4%)	
	Find derivatives and anti- derivatives of hyperbolic,	PLO1	C2	25	Quiz (3%),	
CLO3	trigonometric inverses and combination of them using appropriate techniques.	PLO2	С3	3	Test (10%), Final Exam (15%)	
	Find arc length and area of surfaces of revolutions via	PLO1	C2	14	Assignment (3%),	
CLO4	integration using the formula in Cartesian, parametric and polar form.	PLO2	С3	6	Test (10%), Final Exam (7%)	
	Determine convergence and divergence of improper	PLO1	C2	5	Assignment (3%),	
CLO5	integrals by direct computation.	PLO2	С3	6	Final Exam (8%)	
	Sketch graphs of two variable functions and determine	PLO1	C2	6		
CLO6	continuity of two variable functions at a point via computation of limits.	PLO2	С3	2	Final Exam (8%)	

Teaching Method:

Lectures Tutorials Directed learning Group discussion

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Student Learning Time

Теа	achir	ng ar	nd Learning Activities	Student Learning Time
1	Fac	ce-to	o face Learning	
	a.	Le	cture-Centered Learning	
		Le	cture (3 hrs lecture) x 14 weeks	42
	b.	Stu	udent-Centered Learning	
		In-	class exercises (1 hr) x 14	14
2	Sel	f-Dir	rected Learning	
	a.	Ma	anual, Assignment, Module, E-	
		As	signments	10
	b.	Re tut	vision (preparation for lectures, corials and assignments)	39
	c.	Pre	eparations for Assessments	9
3	For	rmal	Assessment	
	a.	Continuous Assessment (2 tests)		3
	b.		Final Examination (3 hrs)	3
	Total SLT			120

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Weekly Schedule						
Week	Date	Торіс		Remarks		
Week 1	9 – 13 Sept 2018	Parametric Equations & Polar Coord equations, polar coordinate system. Cartesian and polar coordinates.	9 Sept 2018 (Sunday) (Birthday of His Majesty Seri Paduka Baginda Yang Di – Pertuan Agong) 11 Sept 2018 (Tuesday) (Maal Hijrah 1440)			
Week 2	16 – 20 Sept 2018	Graphs of polar equation and interse coordinates.	16 Sept 2018 (Malaysia Day)			
Week 3	23 – 27 Sept 2018	Review: Graphs of trigonometric fun trigonometric identities, and graphs Transcendental Functions: Hyperbol trigonometric functions, and inverse				
Week 4	30 Sept – 4 Oct 2018	Graphs of hyperbolic, hyperbolic inv inverses. Identities of hyperbolic and and solving related equations.	Graphs of hyperbolic, hyperbolic inverses and trigonometric inverses. Identities of hyperbolic and trigonometric inverses, and solving related equations.			
Week 5	7 – 11 October 2018	Differentiation (including implicit rel relations involving hyperbolic and in				
Week 6	14 – 18 October 2018	Integration of functions involving hy using definition, identities and integ	15 Oct 2018 (Monday) (Hol Almarhum Sultan Iskandar) 17/10/2018 Test 1 (Wed, 5-7 pm) Venue: T04, L50 (DK1,2,3), N24 (DK8)			
Week 7	21 – 25 October 2018	Integration using substitution methor trigonometric and hyperbolic substit				
Week 8	28 Oct – 1 Nov 2018	Further Applications of Integration: a surface of revolution in Cartesian for				
Week 9	4 – 8 November 2018	Arc length, area of surface of revolut parametric form.	tion in polar and			
	6 – 8 November 2018	Mid-semester break (3 Days)		6 Nov 2018 (Tuesday)-Deepavali		
Week 10	11 – 15 November 2018	Improper Integrals. L'Hopital's Rule, Integral of first kind		10 – 13 November 2018 (UTM 61st Convocation Ceremony)		
Week 11	18 – 22 November 2018	Integral of second kind		20 Nov 2018 (Tuesday) (Prophet Muhammad's Birthday)		
Week 12	25 – 29 November 2018	Multivariable Functions: Terminology and notation, domain and range of two and three variables functions. Graphs of two variable functions: Surfaces and level curves.		28/11/2018 Test 2 (Wed, 5-7 pm) Venue: N24(DK8,9), L50 (DK1,2,3), T04	4	
<u>-</u>	Prepared by Name: Dr Fuaad (Coordinator) Signature:	la Mohd Siam	Certified by Name: Signature: Date:	·		

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	Week 13	2 – 6 December 2018	Graphs of three variable functions: Level surfaces.		
	Week 14	9 – 13 December 2018	Limits and continuity: Notions of limits and continuity for		
	Week	16 – 20 December 2018	(two paths rule).		
	15	19 – 20 December 2018	Revision Period (2 Days)		
		23 Dec 2018 – 8 Jan 2019	Final Examination (2 Weeks 2 Days)	25 Dec 2018 (Tuesday) (Christmas Day)	

Main References:

1.Abd Wahid Md Raji et.al., Engineering Mathematics 1

References:

- 1. Thomas, G. B., Thomas' Calculus, (2010), Pearson Addison Wesley.
- 2. Bradley, G. L and Smith, K. J, Calculus, (1998), Prentice Hall International, Inc.
- 3. Larson, R., Hostetler, R. P., Edwards, B. H., (2006), Calculus with Analytic Geometry, Houghton Mifflin Company.
- 4. Briggs, W. L and Cochran, L., Calculus, (2011), Pearson Addison Wesley.
- 5. Anton, H. Calculus, (1992), John Wiley & Sons, Inc.
- 6. Glyn James, Advanced Modern Engineering Mathematics, (2004), Addison Wesley.
- 7. Alan Jeffrey, Advanced Engineering Mathematics, (2002), Academic Press.
- 8. Kreyzing, Erwin, Advanced Engineering Mathematics, (1993), John Wiley.

Assessments

No.	Type of Assessment	Number	% each	% total	Week
1	Test 1	1	15	15	6
2	Test 2	1	20	20	12
3	Assignment/Quiz	5	3	15	1-14
4	Final Examination	1	50	50	16-18
Total			100		

Assessment Distribution Based on PLO-CLO											
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	%Т
CLO1	15	4									19
CLO2	7	7									14
CLO3	25	3									28
CLO4	14	6									20
CLO5	5	6									11

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CLO6	6	2					8
%Total	70	30					100

COURSE POLICY

Attendance is compulsory and will be taken in every course meeting. Students with less than 80% total attendance are not allowed to sit for final examination.

Students are required to behave and follow the dressing regulation and etiquette as stated in University regulation while in class.

Any form of plagiarism is not allowed.

Assignments must be submitted on due date. Late submission shall not be accepted and will not be graded.

Notes:

PO1 Fundamental Knowledge	Ability to acquire knowledge on fundamental mathematical concepts, theories and techniques related to current issues as well as knowledge in social science and personal development (C2)	Lectures, tutorials, directed reading.	Examinations, tests, quizzes, assignments.
PO2 Application of Mathematical Knowledge and Computational Techniques and Analysis	Ability to apply and practice skills in mathematical reasoning, construct mathematical proofs and display proficiency in using a variety of mathematical techniques in carrying out mathematical analysis (C3)	Lectures, tutorials, projects (PSM, Group/individual), directed reading, hands-on computer-based exercises, simulation exercises, research training.	Examinations, quizzes, tests, computing output, presentations, project reports, research training report.

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