COURSE INFORMATION

Department/ Faculty:	Department of Mathematical Sciences/ Faculty of Science	**Page:**	1 of 5
Program name:	Bachelor of Science (Mathematics) with Honours		
Course code:	SSCM 1023	**Academic Session/Semester:**	2022/2023/1
Course name:	Mathematical Methods I	**Pre/co requisite (course name and code, if applicable):**	-
Credit hours:	3		

Course synopsis	The course revises and extends Matriculation and STPM topics such as differentiation and integration towards hyperbolic and trigonometric inverses. Applications in computing arc length and area of surfaces of revolution are also included. Other topics covered are improper integrals, parametric equations, polar coordinates, sequence, and series. This later topic serves as an introduction to three dimensional calculus which students will learn in Mathematical Methods II. It is hoped that upon completion of the course, students should have acquired some firm basic tools to pursue further mathematics.			
Course coordinator (if applicable)	Dr Amidora Binti Idris			
Course lecturer	**Name**	**Office**	**Contact no.**	**E-mail**
	Dr Shaymaa M.H. Darwish	C22-439	017-7442849	mdshaymaa@utm.my

Weekly Schedule:

Week & Date	Topic	Remarks
Week 1 (16 – 20 Oct 2022)	**Parametric Equations & Polar Coordinates:** Parametric equations, polar coordinate system. Relationship between Cartesian and polar coordinates.	24 October 2022 Monday (Deepavali)
Week 2 (23 – 27 Oct 2022)	Graphs of polar equation and intersections point in polar coordinates.	
Week 3 (30 Oct – 3 Nov 2022)	Review: Graphs of trigonometric functions, exponential, trigonometric identities, and graphs of f and f^{-1} in general. **Transcendental Functions:** Hyperbolic functions, Inverse trigonometric functions, and inverse hyperbolic functions.	
Week 4 (6 – 10 Nov 2022)	Graphs of hyperbolic, hyperbolic inverses and trigonometric inverses. Identities of hyperbolic and trigonometric inverses and solving related equations.	
Week 5 (13 – 17 Nov 2022)	**Differentiation** (including implicit relation) of functions and relations involving hyperbolic and inverses.	
Week 6 (20 – 24 Nov 2022)	**Integration** of functions involving hyperbolic and inverses using definition, identities and integration by parts. Integration using substitution method, partial fraction, trigonometric and hyperbolic substitutions.	**23 November 2022 Wednesday Test 1 (W1-W4) 8.00pm – 9.30pm**
Week 7 (27 Nov – 1 Dec 2022)	Further Applications of Integration: Arc length, area of surface of revolution in Cartesian form.	
Week 8 (4 – 8 Dec 2022)	**Mid-sem break**	

Week 9 (11 – 15 Dec 2022)	Arc length, area of surface of revolution in polar and parametric form.	
Week 10 (18 – 22 Dec 2022)	**Improper Integrals.** L'Hopital's Rule, Integral of first and second kind	
Week 11 (25 – 29 Dec 2022)	**Limits and continuity:** Notions of limits and continuity for functions of two variables including non-existence of limits (two paths rule).	25 December 2022 Sunday (Christmas Day)
Week 12 (1 – 5 Jan 2023)	**Sequences:** Definition and limits. Convergent and Divergent sequences. The Sandwich theorem. **Series:** Definition, the telescoping and geometric series.	
Week 13 (8 – 12 Jan 2023)	Divergence Test. The integral test and *p*-series. Comparison and Limit Comparison Tests.	**11 January 2023** **Wednesday** **Test 2 (W5-W9)** **8.00pm – 9.30pm**
Week 14 (15 – 19 Jan 2023)	Root and Ratio tests, radius and interval of convergence. Alternating series. Absolute convergence.	
Week 15 (22 – 26 Jan 2023)	**Power Series:** Definition, power series for functions including interval of convergence. Maclaurin and Taylor series. Application of power series.	22 & 23 January 2023 Sunday & Monday (Chinese New Year)

Continuous Assessment		Percentage
1	Test 1	15
2	Test 2	20
3	Quiz	5
4	Group Assignments	10
Final Assessment		Percentage
1	Final Examination	50
100		

Learning resources:

Text book (if applicable)

Nil

Main references

1**.** Abd Wahid Md Raji et.al (2017). Engineering Mathematics

Additional references

1. Joel R. Hass, Christopher Heil, Maurice D.Weir, (2017), Thomas' Calculus: Early Transcendentals, Pearson Addison Wesley.
2. Briggs, W. L and Cochran, L., Calculus: Early Transcendentals, (2018), Pearson Addison Wesley.
3. Glyn James, Advanced Modern Engineering Mathematics, (2018), Addison Wesley.
4. Dean G. Duffy, Advanced Engineering Mathematics with MATLAB, (2018), Chapman & Hall/CRC.

Online
http://elearning.utm.my

Academic honesty and plagiarism:

Attendance is compulsory. Students with less than 80% total attendance are not allowed to sit for the Final Examination.
Any form of plagiarism is not allowed: Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES) . Copying of work (texts, simulation results etc.) from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

Other additional information (Course policy, any specific instruction etc.):

Assignments must be submitted on due dates. Late submission shall not be accepted and will not be graded.
Students are required to behave and follow the dressing regulation and etiquette as stated in University regulation while in class.