MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1.	**Name of Course**	Calculus
2.	**Course Code**	TMA1101
3.	**Type of Course** **(e.g. : Core, major, elective etc.)**	Core
4.	**Synopsis**	To understand and apply the basic ideas of calculus: limit, continuity, differentiation, integration, sequences and series.
5.	**Version** **(State the date of theSenate's approval - previous and the current approval date)**	Current: January 2018 Previous: June 2016
6.	**Name(s) of Academic Staff**	Ng Boon Yian Shahbe binti Mat Desa
7.	**Semester and Year Offered**	Trimester 1 (Beta)
8.	**Credit Value**	4
9.	**Pre-Requisite**	

10. **Objective of the course in the programme: To equip students with various essential mathematical concepts and analytical techniques for problem solving.**

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11. **Justification for including the course in the programme: To provide students with basic mathematical skills for use in subsequent courses.**

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12. **Course Learning Outcomes (CLO)**

		Domain	Level
CLO1:	Apply correct concepts of functions, limits and continuity.	Cognitive	3
CLO2:	Apply the basics of differentiation and related methods.	Cognitive	3
CLO3:	Apply the basics of integration and related methods.	Cognitive	3
CLO4:	Use power series and Fourier series to represent functions.	Cognitive	3

13. **Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment:**

Course Learning Outcomes (CLO) (Must tally with CLOs in item 12)	Programme Learning Outcomes (PLO)												Teaching Methods	Assessment Method
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12		
CLO1	✓	✓	✓	✓									Lecture/Tutorial	Quiz/Test/Final Exam
CLO2	✓	✓	✓	✓									Lecture/Tutorial	Quiz/Test/Final Exam
CLO3	✓	✓	✓	✓									Lecture/Tutorial	Quiz/Test/Final Exam
CLO4	✓	✓	✓	✓									Lecture/Tutorial	Quiz/Final Exam
Total	**4**	**4**	**4**	**4**									*Indicate the relevancy between the CLO and PLO by ticking "✓" the appropriate relevant box (This description must be read together with standards 2.1.2, 2.2.1, and 2.2.2 in Area 2 – pages 16 & 18 of COPPA 2.0)*	

14. **Transferable Skills:**

15. **Distribution of Student Learning Time (SLT)**

	Course Content Outline	**CLO	Teaching and Learning Activities – Guided Learning (F2F)* *L	*T	*P	*O	Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
1	**Functions** **Functions and their graphs, combining functions; use of complex numbers in deriving trigonometric identities.**	**CL01**	4	3				6	13
2	**Limits and Continuity** **Limits, limits involving infinity; continuity, at a point and on an interval; theorems involving continuous functions.**	**CL01**	3	2				4	9
3	**Derivatives and Differentiation Rules** **Derivative, as a limit and as a function; higher order derivatives; differentiation rules; the chain rule; implicit differentiation.**	**CL02**	2	3			4	4	13
4	**Applications of Differentiation** **Maximum and minimum values of functions; the mean value theorem; derivatives and shapes of curves;.indeterminate forms and l'Hospital's rule.**	**CL02**	4	3				6	13
5	**Integrals and Techniques of Integration** **Antiderivatives and integrals; the definite integral as limit of finite sums; the fundamental theorem of calculus; substitution rule and integration by parts.**	**CL03**	2	3			4	4	13
6	**Applications of Integration** **Area between curves; volumes.**	**CL03**	2	1				2	5
7	**Infinite Sequences and Series** **Sequences, convergence and limits; series, convergence and tests of convergence; power series, representation of functions as power series; Taylor and Maclaurin series, Fourier series.**	**CL04**	8	6			4	11	29

	8	**Functions of Several Variables and Partial Differentiation** **Functions of severable variables; partial derivatives; the chain rule.**	**CL02**	3	1			2	3	9
	9	**Ordinary Differential Equations** **Linear and non-linear equations, degree and order; first order equations, separable variables, linear and exact; second order equations with constant coefficients; applications of differential equations; numerical solutions using Runge-Kutta methods.**	**CL02 & CL03**	8	5				11	24
									Total SLT	**128**

SUMMATIVE ASSESSMENT

1. Continuous Assessment	**Percentage %**	**Total SLT**
Quizzes	20%	(under tutorials)
Tests	30%	10
Total SLT for Continuous Assessment		**10**

2. Final Assessment	**Percentage %**	**Total SLT**	
		F2F	**ILT**
Final Exam	50%	2	20
Total SLT for Final Assessment (F2F + NF2F)		**22**	
Grand Total	**100%**	**160**	

****Indicate the CLO based on the CLO's numbering in Item 12.**
***L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face**

16 . **Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):**

17 . **Main References:**
Stewart, J. (2009). Calculus(6th ed.). Thomson Brooks/Cole.

18 . **Additional References:**
Thomas, G. B., Weir, M. D. & Hass, J. (2013). Thomas' Calculus (13th ed.). Pearson

Note:
Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.