

COURSE INFORMATION

1 .	Name of Course	Calculus	
2 .	Course Code	PCM0235	
3 .	Type of Course (e.g. : Core, major, elective etc.)	Core	
4 .	Synopsis	This course introduces basic calculus to students. Topics covered in calculus are limits and continuity of a function, differentiation and its applications to find extreme values, integration and its application to find areas of bounded regions and volumes	
5 .	Version (State the date of the Senate's approval - previous and the current approval date)	Current: August 2017 Previous: August 2015	
6 .	Name(s) of Academic Staff	Mohd Daud Hassan, Nurhayati Yusoff.	
7 .	Semester and Year Offered	Trimester 2	
8 .	Credit Value	4	
9 .	Pre-Requisite	PAM0135 – Algebra	
10 .	Objective of the course in the programme:	To expose students to the basic topics in calculus and prepare them with basic knowledge in differentiation and integration.	
11 .	Justification for including the course in the programme:	To equip and prepare students with the basic calculus in preparation for the mathematic courses in degree.	
12 .	Course Learning Outcomes (CLO)	Domain	Level
	CLO1: Solve the problems related to limits of various functions.	Cognitive	Level 3
	CLO2: Use various techniques to solve the derivative and integration for different types of functions.	Cognitive	Level 3
	CLO3: Solve the problems related to applications of differentiation and integration.	Cognitive	Level 3
	CLO4: Solve the first and second order of differential equations.	Cognitive	Level 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	
		P L O 1	P L O 2	P L O 3	P L O 4	P L O 5	P L O 6	P L O 7	P L O 8	P L O 9	P L O 10	P L O 11			P L O 12
	CLO1	✓	✓				✓							Lecture, Tutorial	Quiz, Test, Final Examination
	CLO2	✓	✓				✓							Lecture, Tutorial	Quiz, Test, Final Examination
	CLO3	✓	✓				✓							Lecture, Tutorial	Quiz, Test, Final Examination
	CLO4	✓	✓				✓							Lecture, Tutorial	Quiz, Final Examination
	Total	4	4				4								
	<i>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)</i>														
14 .	Transferable Skills: Manipulative, Team work, Differentiation and Integration Skills														
15 .	Distribution of Student Learning Time (SLT)														
	Course Content Outline	**CLO	Teaching and Learning Activities				Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT						
			Guided Learning (F2F)*												
			*L	*T	*P	*O									
1	Limits and Continuity Limits by intuitive and computation approaches; Continuity for polynomials, rational functions, functions involve radicals, piece-wise, composite, and trigonometry functions; One sided limits; Limits at infinity; Infinite limits; Tangents and derivatives at a point.	CLO1	6	2			1	9	18						
2	Derivatives Concept of slope of tangent lines; Differentiability; Differentiation rules and techniques: Chain rule; Power rule; Power rule combined with the chain rule; Derivatives of trigonometric function, logarithmic function, and exponential functions; Logarithmic differentiation; Implicit differentiation and higher derivatives.	CLO2	6	3			1	10	20						
3	Applications of Differentiation Tangents and normals; Related rates problems; Maximum and minimum values; Increasing and decreasing functions; Critical points; Local extrema; Absolute extrema; Concavity of a function; Inflection points; Applied maximum and minimum problems. Motions along straight line; Displacement, Velocity, Acceleration.	CLO3	7	2			1	10	20						

4	Integration The indefinite and definite integrals; Integration techniques and formulas; Integrating polynomial, trigonometric, logarithmic and exponential functions; Integration techniques: Substitution, integration by parts, and integration by partial fraction decomposition.	CLO2	7	2			1	10	20
5	Applications of Integration Area under a curve and between curves; Volumes of solids of revolution.	CLO3	6	2			1	9	18
6	Differential Equations First order linear differential equations: Separation of variables; Integrating factor methods; Second order linear differential equations with constant coefficients: Homogeneous equation.	CLO4	5	2			0	7	14
Total SLT									110
SUMMATIVE ASSESSMENT									
1. Continuous Assessment					Percentage %			Total SLT	
Quiz					20%			16	
Test					30%			12	
					Total SLT for Continuous Assessment			28	
2. Final Assessment					Percentage %			Total SLT	
Final Exam					50%			F2F	ILT
								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): None								
17	Main References: Thomas Jr., G.B; Weir, M. B; Hass, J.R (2014). Thomas' calculus early transcendentals (12th ed.). Pearson.								
18	Additional References: Larson, R. & Edwards, B. (2014). Calculus (10th ed.). Boston: Brooks/Cole. Adams, R.A. & Essex, C. (2013). Calculus (8th ed.). Ontario: Pearson Canada Inc. Weir, M.D. & Hass, J. (2014). Thomas' calculus (13th ed.). Boston: Pearson Education, Inc.								

Note:

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