Teaching Plan
FAKULTI KEJURUTERAAN ELEKTRIK
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ENGINEERING MATHEMATICS

BACS 1213	SEMESTER 2	SESI 2008/2009

BACS 1213 ENGINEERING MATHEMATICS (3, 2, 2)

Type Of Subject: P

1.0 Learning Outcomes

By the end of this course, students should be able:
1. to find the multivariable function together with its domain and range
2. to evaluate the integrals of the function with double and triple integral by using various techniques
3. to use the techniques of integration to calculate the area and the volume of the region
4. to evaluate vector-valued function
5. to apply the knowledge of vector-valued function in physical and engineering fields

2.0 Synopsis

This course consists of three chapters: Functions of Several Variables, Multiple Integrals and Vector-valued Functions. The syllabus is developed by introducing the concepts of the functions with severable variables, integration and also vector-valued function, followed by learning various techniques in solving the problems and its application in physical and engineering fields.

3.0 Practical Application

During this course, students will attend 14 tutorial sessions, and each session consists of two hours of mathematical activities.

4.0 References

[1] Finney R.L., Weir M.D. and Giordano F.R.,THOMAS'S CALCULUS 10th Ed,Pearson 2001
[2] Anton H., CALCULUS, 8th Edition, John Wiley 1992.
[3] Smith R.T. and Minton R.B., MULTIVARIABLE CALCULUS, McGraw-Hill 2002.
[4] Steward J., CALCULUS- CONCEPTS AND CONTEXTS, Brooks/Cole, 2nd Edition, 2001
[5] Stroud K.A., ENGINEERING MATHEMATICS, 5th Edition, Palgrave Macmillan 2001

5.0 Course Implementations

i) Lectures
   - 2 hours per week for 14 weeks (Total = 28 hours)

ii) Tutorials
   - 2 hours per week for 14 weeks (Total = 28 hours)

iii) Assessment

6.0 Course Evaluations

Course Works:	
Tutorials	5%
Quizzes	15%
Mid-semester Test	25%
Assignments	15%
Final Examination	40%
Total	100%

7.0 Method Of Assessment

Component	Knowledge	Competency	Attitude	Communication
Tests/Quizzes	√	√		
Assignments	√	√		√
Tutorials	√	√	√	√

8.0 Detail Syllabus and Teaching Plan

Week	Session	Contents	Remarks
1 30/12/08	Lecture 1 Tutorial	**Chapter 1: Multivariable Functions** • Functions of two or more variables Exercises	New Year 2009
2 5/01/09	Lecture 2 Tutorial 1	**Chapter 1: Multivariable Functions** • Limits and continuity Tutorial 1 – Topics related to Lecture 1	
3 12/01/09	Lecture 3 Tutorial 2	**Chapter 1: Multivariable Functions** • Partial derivatives Tutorial 2 – Topics related to Lecture 2	
4 19/01/09	Lecture 4 Tutorial 3	**Chapter 1: Multivariable Functions** • Total Differential • The Chain Rule Tutorial 3 – Topics related to Lecture 3	**Quiz 1 (5%)** Scope : Lecture 1 & 2
5 26/01/09		**Semester Break**	Chinese New Year
6 2/02/09	Lecture 5 Tutorial 4	**Chapter 1: Multivariable Functions** • Implicit Differentiation • Local Extrema Tutorial 4 – Topics related to Lecture 4	**Distribute Assignment Questions** Scope: Chapter I - II
7 9/02/09	Lecture 6 Tutorial 5	**Chapter 2: Multiple Integrals** • Double Integral • Evaluating Double Integral • Double Integral Over Non-rectangular Regions Tutorial 5 – Topics related to Lecture 5	**Quiz 2 (5%)** Scope: Lecture 3 & 4
8 16/02/09	Lecture 7 Tutorial 6	**Chapter 2: Multiple Integrals** • Double Integral in Polar Coordinates • Triple Integral Tutorial 6 – Topics related to Lecture 6	

9 23/02/09	Lecture 8	**Chapter 2: Multiple Integrals** • Triple Integral (Continuation)	**Mid-term Test (25%)** Scope: Lecture 1 - 7 (expected date 25/02/09)
	Tutorial 7	Tutorial 7 – Topics related to Lecture 7	
10 2/03/09	Lecture 9	**Chapter 2: Multiple Integrals** • Triple Integral in Cylindrical and Spherical Coordinates • Moment and Centre of Gravity	
	Tutorial 8	Tutorial 8 – Topics related to Lecture 8	
11 9/03/09	Lecture 10	**Chapter 2: Multiple Integrals** • Moment and Centre of Gravity	
	Tutorial 9	Tutorial 9 – Topics related to Lecture 9	
12 16/03/09	Lecture 11	**Chapter 3: Vector-Valued Functions** • Vector Functions and Its Operations • Differentiation of Vector-valued Functions	**Quiz 3 (5%)** Scope : Lecture 9
	Tutorial 10	Tutorial 10 – Topics related to Lecture 10	
13 23/3/09	Lecture 12	**Chapter 3: Vector-Valued Functions** • Unit Tangent Vector • Integration of Vector-valued Functions	
	Tutorial 11	Tutorial 11 – Topics related to Lecture 11	
14 30/3/09	Lecture 13	**Chapter 3: Vector-Valued Functions** • Curvature • Torsion • Unit Binormal Vector	**Submit Assignment (15%)**
	Tutorial 12	Tutorial 12 – Topics related to Lecture 12	
15 6/04/09	Lecture 14	**Chapter 3: Vector-Valued Functions** • Motion Along a Curve • Partial Derivatives of Vector-valued Functions	
	Tutorial 13	Tutorial 13 – Topics related to Lecture 13 & 14	
16 13/04/09		**FINAL EXAMINATION**	Melaka Historical Day, Maulidur Rasul
17 20/04/09		**FINAL EXAMINATION**	