Calculus Lecture Notes for ZCA 110

based on Thomas' Calculus, 11th Edition

by George B. Thomas, Maurice D. Weir, Joel Hass, Frank R. Giordano, Addison Wesley, 11th edition

prepared by

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Universiti Sains Malaysia

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PUSAT PENGAJIAN SAINS FIZIK
UNIVERSITI SAINS MALAYSIA

First Semester, 2016/17 Academic Session

COURSE DETAILS

Course name: Mathematical Methods I

Course code: ZCA 110

Credit hours: 4 (i.e. 4 lectures per week for 14 weeks, plus tutorial sessions)

LECTURERS

- Three separate classes for ZCA 110 (Groups: A, B, and C) handled concurrently by three lecturers:

  A group: Dr. Norhaslinda Mohamed Tahrin (NMT)
  B group: Dr. Yoon Tiem Leong (YTL)
  C group: Dr. Wong Khai Ming (WKM)

COURSE DESCRIPTIONS

- A core course offered by School of Physics
- Course conducted in English, but the students can answer the final exam either in Bahasa Malaysia or English

Duration: 5th September 2016 – 16th December 2016

Semester Break: 24th – 30th October 2016

Meeting times:
Mon 12.00 noon – 12.50 pm
Wed 9.00 – 9.50 am
Thurs 11.00 – 11.50 am
Fri 11.00 – 11.50 am

Pre-requisite: None, BUT will assume that students are familiar with basic mathematics at STPM or Matrikulasi level (i.e. arithmetic of

addition, subtraction, division and multiplication; basic algebra, geometry, trigonometry, simple differentiation, and integration)

E-learn: For updates, announcements, assignments, etc.

CONTENTS

Preliminaries: Sets, real numbers, rational and complex numbers (read the Appendix section of Thomas' calculus)

This is basically a Calculus course covering the following topics:

- Functions, limits, and continuity
- Differentiation and its applications
- Integration, techniques of integration, and its applications
- Transcendental functions
- Sequences and series

OBJECTIVES

1. Differentiation: learn the different rules of differentiation, and its applications

2. Integration: learn the different techniques of integration, and its applications

3. To learn the calculus of transcendental functions, and the basic concepts on series

COURSE EXPECTATIONS

After completing this course, students should be:

- Well-versed in the so-called foundation mathematics that will be needed for numerous applications in physics

- Well-prepared for more advanced mathematics courses as well (e.g. ZCT 112/3, ZCT 210/4, ZCT 219/4, etc.)

CONSULTATION HOURS

Consult your respective lecturers for details.

ASSESSMENT

COMPONENTS	DESCRIPTION	WEIGHTAGE
Course work	Three (3) tests – 15% (at 5% each) Quizzes – 5% Assignments – 20%	40%
Final examination	Will cover all topics	60%
Attendance	• will be recorded • students missing tests without valid reasons/M.C. will get zero • students with attendance less than 70% will be barred from sitting for the final examination	
Total		100%

TESTS

	Dates	**Time**	**Venue**
Test 1	21st October 2016 (F)	11.00 – 12.00 noon	E41*
Test 2	28th November 2016 (M)	12.00 – 1.00 pm	E41*
Test 3	16th December 2016 (F)	11.00 – 12.00 noon	E41*

* Basement of PHS II (Adjacent to Eureka building)

Note: All students (A, B, C groups) will sit for the same tests and final examination. Topics covered will be announced later.

ASSIGNMENTS and TUTORIALS

- About eight (8) assignments to be completed by students throughout the course duration
- Students are required to submit them to the respective lecturers
- All assignments will be graded by the tutors
- Assignments received after the respective due date will not be graded (which means that you will get zero for that particular assignment)
- Tutorial sessions – each session is to be held during one of the usual lecture hours. Details of which will be announced later by your respective lecturers

REFERENCES

Main textbook

Thomas' Calculus Early Transcendentals, 11th Edition, G.B. Thomas, as revised by MD Weir, J Hass and F.R. Giordano, Pearson International Edition, 2008

Additional references

1. S.L. Salas, E. Hille, and G.J. Etgen, Calculus, John Wiley & Sons, New York, 9th Edition, 2003, John Wiley & Sons.

2. Edwards and Penny, Calculus, 6th Edition, 2002, Prentice Hall.

3. Gerald L. Bradley and Karl J. Smith, Calculus, 2nd Edition, 1999, Prentice Hall.

Enjoy! ☺