



The University of Sydney

School of Mathematics and Statistics

Summer School 2012 Information Sheet SS1003

General Information about Summer School Courses offered by the School can be found on the Summer School Web page.

<http://www.maths.usyd.edu.au/u/UG/SS/>

SS1003 Integral Calculus and Modelling (Summer School)

General Information

The unit of study MATH1003 Integral Calculus and Modelling is offered at the Summer School as SS1003.

The Tutorial Exercises and Course Notes used will be the same as those used in the regular course.

Lecturer Dr Bob Crossman: bobc@maths.usyd.edu.au :Room 527 Carlaw

Course Notes

NR O'Brian, CJ Durrant and DJ Galloway. Integral Calculus and Modelling. School of Mathematics and Statistics, University of Sydney, Sydney, NSW, Australia, 2010.

The course notes have essentially not changed for the last few years. They are the same notes used in Semester 2 MATH1003. Recent previous editions of the notes are suitable.

The notes are now available for purchase at Kopystop, 55 Mountain St, Broadway, phone: 9211 2733. Please note that Kopystop will be closing at 3pm on Wednesday 21 December 2011 and re-opening on Wednesday 13 January 2011.

Tutorial Exercises





The Tutorial Exercises are available on the SS1003 website

<http://www.maths.usyd.edu.au/u/UG/SS/SS1003/> .

Solutions to tutorials and assignments will be progressively posted on the website.

Tutorials

Tutorials are held every day following the lecture and will generally focus on material covered that day in the lecture.

	T1: Room 353	T2: Room 355	T3: Room 356	T4: Room 359
Tutor				
	Bob Crossman	Graham White	Van Nguyen	Xin Liu
Student Surname	A to E	F to K	L to M	N to Z

Tutorial attendance will be recorded but not count quantitatively towards the assessment.

Assessment

The final raw mark for this unit will be calculated as follows:

75%: **Examination** (which covers material in the course notes and the 12 tutorial sheets). It will be held on 1:50 pm Wednesday, 22 February 2011, in one or both of 350/351

- The format is all extended answer questions (no multiple choice).

25%: **Quiz** mark which is the total of the **best two marks from three** quizzes:

- Quiz 1 - Tuesday 24 Jan based on material in Tutorials 1, 2 and 3
- Quiz 2 - Monday 6 Feb based on material in Tutorials 4, 5 and 6
- Quiz 3 - Tues 14 Feb - based on material in Tutorials 7, 8 and 9

Quizzes will either be held in the lecture or tutorial on that day (to be advised) depending on final numbers. ***There will be no special consideration given for circumstances which cause one of the three quizzes to be missed.***

Your **final raw mark** is then scaled to produce your final mark. Marks are scaled so that the distribution of grades is consistent with the quality of the class, and the difficulty of the unit, as required by the University.

Assignments

Three assignments will be set and available from the website. Assignments **do not count** quantitatively towards your final mark. They are intended to provide **a source of feedback**. They will be promptly marked with comment where relevant and returned before the corresponding quizzes.

- Assignment 1 is based on material in Tutorials 1, 2 and 3 and is due at the start of the tutorial on Tuesday 17 Jan.
- Assignment 2 is based on material in Tutorials 4, 5 and 6 and is due at the start of the tutorial on Monday 30 Jan.
- Assignment 3 is based on material in Tutorials 7, 8 and 9 and is due at the start of the tutorial on Tuesday 7 Feb.

Timetable

SS1003 Timetable 2012												
	Week 1		Week 2		Week 3		Week 4		Week 5		Week 6	
	Mon 9	Tues 10	Mon 16	Tues 17	Mon 23	Tues 24	Mon 30	Tues 31	Mon 6	Tues 7	Mon 13	Tues 14
Tutorial	1	2	3	4	5	6	7	8	9	10	11	12
Assignment				A1 due	A1 ret		A2 due	A2 ret		A3 due	A3 ret	
Quiz						Quiz 1			Quiz 2			Quiz 3
				A1 (T1,T2,T3)			A2 (T4,T5,T6)			A3 (T7,T8,T9)		
					Q1 (T1,T2,T3)			Q2 (T4,T5,T6)			Q3 (T7,T8,T9)	

Consultation

I will be generally available for consultation on Tuesdays from 5 to 6 pm in Room 527. If possible, please indicate in advance if you will be attending. I am also available at other times on Mondays and Tuesdays by appointment.

Communication

Communication will generally be by announcements in lectures and information posted on the website. It is your responsibility to regularly check the website. Email is the best way to contact the Lecturer or your Tutor.

Dr Bob Crossman, December 2011

Week Topic Content Guidelines

Changes and omissions will be advised during the course

Week 1

Riemann sums Upper and lower Riemann sums
Definition of definite integral
Non-positive functions
Difference between upper and lower sums
Definite integral: Evaluation of integrals
Theory & applications Estimation of integrals and sums
Properties of the definite integral
Fundamental Theorem Part II

Week 2

Further applications Areas and volumes by slicing
Integration by substitution I
Volumes by shells
Further applications Integration by parts
Indefinite integral Fundamental Theorem Part I
Functions defined by integrals

Week 3

Log & exp functions Natural logarithm
Natural exponential
General forms
Introduction to Properties of models
models and DEs Direction fields
Visualization of solution curves

Week 4

First-order DEs I Classification of differential equations
Separable equations
Integration by substitution II
First-order DEs II Models including growth and decay
Partial fractions

Week 5

First-order DEs III Linear equations
Examples and models
Further examples Radio-active dating
and models Flow and mixing problems

Week 6

Higher-order equations Second-order homogeneous linear
Boundary conditions
Factorization, equal root case
Systems of equations Reduction to second-order
Predator-prey systems
SHM, growing and damped oscillations