Teacher

Dr Neil Course

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Course Website

You will find course information, handouts, past exams, exam dates, etc. on my website

- www.neilcourse.co.uk/math113.html

Required Text

- George B. Thomas Jr., Maurice D. Weir and Joel Hass, *Thomas' Calculus*, Pearson.

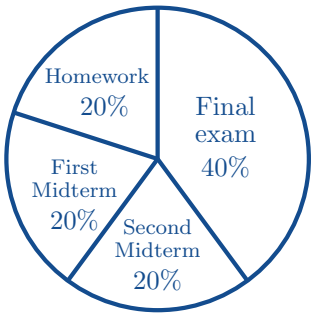
New students *must* buy a new copy of this book which includes a *Pearson MyLab and Mastering* access code. Repeating students should already have their access code.

Homework

- website: pearsonmylabandmastering.com
- course id: course93502

Contents

"The only way to learn mathematics is to do mathematics." – Paul Halmos (1916–2006)



This course has 5 hours of lectures per week. I expect you to spend atleast 10 hours every week, studying outside of class. Every week you should be reading the textbook, discussing the material with other students, attempting the exercise questions in the text book and making use of the Pearson website.

All of the homework will utilise the Pearson website. It is your responsibility to log in to this website weekly and to complete each piece of homework before its deadline. Your homework marks will only be counted if the average of your exam marks is atleast 20%.

Office Hour

If you have any questions, you can find me in my office (C333) each

- Wednesday, from 14:00 to 15:00;

Alternately, you can email your questions to me. Please don't forget to write "MATH113" or "Calculus" in your emails.

Syllabus[1]

Week	Topics Covered	Independent Study Expected
1	1.1 Functions and Their Graphs 1.2 Combining Functions; Shifting and Scaling Graphs 1.3 Trigonometric Functions	Purchase the textbook. Register for the homework.
2	2.2 Limit of a Function and Limit Laws 2.3 The Precise Definition of a Limit	Read the textbook.
3	2.4 One-Sided Limits 2.5 Continuity 2.6 Limits Involving Infinity; Asymptotes of Graphs	Read the textbook. Solve the homework problems.
4	3.1 Tangents and the Derivative at a Point 3.2 The Derivative as a Function 3.3 Differentiation Rules 3.4 The Derivative as a Rate of Change	Read the textbook. Solve the homework problems.
5	3.5 Derivatives of Trigonometric Functions 3.6 The Chain Rule 3.7 Implicit Differentiation	Read the textbook. Solve the homework problems.
6	3.8 Related Rates 3.9 Linearisation and Differentials 4.1 Extreme Values of Functions 4.2 The Mean Value Theorem	Read the textbook. Solve the homework problems.
7	4.3 Monotonic Functions and the First Derivative Test 4.4 Concavity and Curve Sketching 4.5 Applied Optimisation	Read the textbook. Solve the homework problems.
8	4.7 Antiderivatives 5.1 Area and Estimating with Finite Sums 5.2 Sigma Notation and Limits of Finite Sums	Read the textbook. Solve the homework problems.
9	(no lessons this week)	
10	5.3 The Definite Integral 5.4 The Fundamental Theorem of Calculus 5.5 Indefinite Integrals and the Substitution Method	Read the textbook. Solve the homework problems.
11	5.6 Substitution and Area Between Curves 6.1 Volumes Using Cross-Sections 6.2 Volumes Using Cylindrical Shells	Read the textbook. Solve the homework problems.
12	6.3 Arc Length 6.4 Areas of Surfaces of Revolution	Read the textbook. Solve the homework problems.
13	7.1 Inverse Functions and Their Derivatives 7.2 Natural Logarithms 7.3 Exponential Functions	Read the textbook. Solve the homework problems.
14	7.5 Indeterminate Forms and L'Hôpital's Rule 7.6 Inverse Trigonometric Functions 7.7 Hyperbolic Functions & Inverse Hyperbolic Functions	Read the textbook. Solve the homework problems.

[1] Schedule subject to change. Full syllabus available at `www.neilcourse.co.uk/math113.html`