Subject Profile

MT253:  APPLIED MATHEMATICAL ANALYSIS  2000/2
(includes MT255 as first half, MT256 as second half; MT255 ends August 25,
MT256 begins August 28)

Pre:  MT250

Lecturer:  Dr. Phil Diamond
Room:  722A, Priestley (Mathematics) Building (#67)
Phone:  3365 3253
Email:  pmnd@maths.uq.edu.au
Office Hours:  9–10AM, Mon., Wed., Fri.

Timetable:  Lectures:  M, W and F Room 3–206  8am
            Tutorial:  F 2,3 or 4pm  Room 43–102

Assessment:

MT255:  1 Hour Final Exam counting 70% (end of semester); 5 weekly assignments, 6% each
MT256:  1 Hour Final Exam counting 70% (end of semester); 5 weekly assignments, 6% each
MT253:  2 Hour Final Exam counting 70% (end of semester)
         10 weekly assignments, 3% each

Collaboration on assignments is allowed, even encouraged, but you must write
out your own solutions in your own way. Identical assignment solutions may
share the marks!

            (John Wiley & Sons, Inc.)
            (MT255:  Chaps. 3 & 5; MT256:  Chaps. 10 & 11)

There are many other books containing this material, especially the ordinary and partial
differential equations, which forms a standard part of the mathematician’s, physical
scientist’s and engineer’s toolkit. Other books along the lines of Kreyszig may be found
under the call number QA401. More specialized books may be found under QA371,
QA372, QA404 and QA432.

A couple of good specialized texts are

(MT253/5:)  W T Thompson, Laplace Transformation, QA432.T5 1960

MT253/6:)  R V Churchill, Fourier Series and Boundary Value Problems, QA404.C6
           1978
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The course aims to equip you with further tools in the general area of differential equations:

In the first half, also offered as MT255, we look at systems of linear ODE’s, how to solve them, and how they arise in applications. The Laplace transform is introduced as a method of solving (systems of) ODE’s. The idea of stability of a solution of a system, and the description of a system in its ‘phase-plane’ are discussed.

In the second half, also being offered as MT256, the three main types of linear partial DE’s (PDE’s) are introduced in the context of applications to vibrations of a stretched string, steady and unsteady diffusion. Fourier’s method of ‘separation of variables and superposition’ is presented in this context, including an introduction to Fourier Series.

Through working problems, the student will have the opportunity to acquire a basic working knowledge of these concepts, and should have the background necessary for more advanced analysis and modelling courses in mathematics, physics and engineering, in particular for MATH3101, 3102, 3104 and 3403.

Assessment Criteria: Your grade in this subject will be determined by the highest of the following levels of achievement that you consistently display in the items of summative assessment.

Grade of 7: the student demonstrates an outstanding understanding of the theory of the topics listed in the subject outline, and outstanding ability to apply the associated techniques to solve problems.

Grade of 6: the student demonstrates a comprehensive understanding of the theory of the topics listed in the subject outline, and proficiency in applying the associated techniques to solve problems.

Grade of 5: the student demonstrates an adequate understanding of the theory of the topics listed in the subject outline, and the ability to apply the associated techniques to solve moderately difficult problems.

Grade of 4: the student demonstrates an understanding of the theory of the topics listed in the subject outline, and the ability to apply the associated techniques to solve straightforward problems.

Grade of 3: the student demonstrates some understanding of the theory of the topics listed in the subject outline, and the ability to apply the associated techniques to solve some straightforward problems.

Grade of 2: the student demonstrates little understanding of the theory of the topics listed in the subject outline, and little ability to apply the associated techniques to solve problems.

Grade of 1: the student demonstrates very little understanding of the theory of the topics listed in the subject outline, and very little ability to apply the associated techniques to solve problems.