Introduction

This COURSE PAK is, except for the assignments and minor revisions, the same as the COURSE PAK produced by Professor J.C. Taylor. We are indebted to him for permission to use and revise his COURSE PAK. It is designed to enable you to use a variety of calculus books to study advanced calculus — as presented in Mathematics 189-265. If you have not already got a calculus book from a previous course and wish to buy one, then any edition of Adams *Calculus of Several Variables* or of *Vector Calculus* by Marsden and Tromba is suggested, with a preference for the book by Marsden and Tromba. There are also a number of copies of these texts in PSEAL available for consultation.

The syllabus, as outlined, is subject to modification, mainly by the possible omission of certain topics from the requirements for the final examination, or by omission from lectures (and hence from the final examination).

The assignments are set so as to be handed in every two weeks. The actual dates for submission of assignments will vary from year to year and with the instructors.

The assignments in the old COURSE PAK are now used as tutorial problems. They contain instructional information, especially so in the case of assignment five. Other information that will be of use is listed under the following headings: Green's theorem, heat equation, chain rule, implicit function theorem, Stokes' theorem, and the Divergence theorem. Of these six, the most important are those dealing with Green's theorem, the chain rule, the implicit function theorem, and the Divergence theorem. The information on Stokes' theorem is essentially background information, while the material on the heat equation has importance for understanding applications.

The books referred to in the course outline are listed below. The books by Edwards and Penney, Larson et al, and Thomas and Finney have a lot of good, colourful graphics.

Book List

1. Robert A. Adams, *Calculus of Several Variables*, Addison–Wesley Publishers limited, 2nd and 3rd editions.

2. C. Henry Edwards & David E. Penney, *Calculus with analytic geometry early transcendentals*, Prentice Hall, 5th edition.

3. R.E. Larson, R.B. Hostetler & B.H. Edwards, *Calculus with analytic geometry*, D.C. Heath and Company, 5th edition.

4. Jerrold E. Marsden & Anthony J. Tromba, *Vector Calculus*, W.H. Freeman and Company, 3rd and 4th edition.

5. Salas & Hille, *Calculus (several variables)*, John Wiley & Sons Inc, seventh edition.

6. Murray Spiegel, *Vector Calculus (Schaum's outline series)*, McGraw–Hill,

7. James Stewart, *Multivariable Calculus*, Brooks/Cole, 4th edition.

8. George B. Thomas & Ross L. Finney, *Calculus and Analytic Geometry Part II*, Addison–Wesley Publishers limited, 9th edition.

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