

620-233 Vector Analysis (Advanced)

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 lectures (three per week) and 11 1-hour tutorials (one per week) Total Time Commitment: 120 hours
Prerequisites:	An H3 or better in [07]620-120 (UMEP Maths for High Achieving Students) or [07]620-121 together with an H3 or better in [07]620-123 or [07]620-113; or by invitation from the Head of Department.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may gain credit for only one of 620-231 and 620-233. Students in the combined degree BE/BSc should note that credit exclusions exist between this subject and Engineering mathematics subjects. Refer to entries for 431-201 Engineering Analysis A and 431-202 Engineering Analysis B for details.
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Dr P Milley
Subject Overview:	<p>This subject covers the material presented in 620-231 Vector Analysis plus additional material designed to provide deeper insight into interesting areas of vector analysis.</p> <p>The subject develops the manipulation of partial derivatives and vector differential operators. Students should develop the ability to obtain extrema of functions of several variables; calculate line, surface and volume integrals; and to work in curvilinear coordinates. This subject demonstrates the fundamental concepts of vector calculus and the relations between line, surface and volume integrals.</p> <p>Functions of several variables topics include limits, continuity, differentiability, matrix version of chain rule, Jacobian, implicit and inverse function theorems, Taylor polynomials and Lagrange multipliers. Vector calculus topics include vector fields, flow lines, curvature, torsion, gradient, divergence, curl and Laplacian. Integrals over paths and surfaces topics include line, surface and volume integrals; change of variables; applications including averages, moments of inertia, centre of mass, Green's theorem, Divergence theorem and Stokes' theorem; and curvilinear coordinates. Possible additional topics include differential geometry of surfaces.</p>
Assessment:	Up to 36 pages of written assignments due during the semester (20%); a 3-hour written examination in the examination period (80%).
Prescribed Texts:	None
Breadth Options:	<p>This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008.</p> <p>This subject or an equivalent will be available as breadth in the future.</p> <p>Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available.</p> <p>2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.</p>
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees

Notes:

This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BAsC or a combined BSc course.