620-332 Integral Transforms & Asymptotics

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: 36 lectures (three per week) and up to 12 practice classes (one per week) Total Time Commitment: 120 hours
Prerequisites:	One of 620-232 or 620-234; and one of 620-221 or 620-252.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
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:	A/Prof P Pearce
Subject Overview:	This subject introduces methods of evaluating real integrals using complex analysis; and develops methods for evaluating and inverting Fourier, Laplace and Mellin transforms, with selected applications including summing series and computing asymptotic series. Students should learn what an asymptotic expansion is and how it provides approximations; how to use Watson's lemma and the methods of Laplace, stationary phase and steepest descents to evaluate asymptotic expressions; and how to find asymptotic solutions to ordinary differential equations. This subject demonstrates a range of important and useful techniques and their power in solving problems in applied mathematics. Complex analysis covers advanced applications of contour integration. Integral transforms covers Fourier, Laplace and Mellin transforms; inversion by contour integration; convolution; and applications. Asymptotic expansions covers convergence and divergence; integrals with a large parameter, Watson's Lemma, Laplace's method, steepest descent, stationary phase; and WKB method for ordinary differential equations.
Assessment:	A 45-minute written test held mid-semester (either 0% or 20%); a 3-hour written examination in the examination period (80% or 100%). The relative weighting of the examination and the mid-semester test will be chosen so as to maximise the student's final mark.
Prescribed Texts:	None
Breadth Options:	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. This subject or an equivalent will be available as breadth in the future. 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. 2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
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.
Related Course(s):	Bachelor of Arts Bachelor of Arts and Bachelor of Science

	Bachelor of Arts and Sciences Bachelor of Science