505-975 Probability and Distribution Theory

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	Distance
Time Commitment:	Contact Hours: None Total Time Commitment: 8-12 hours total study time per week
Prerequisites:	505-105 Mathematical Background for Biostatistics (MBB)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	Dr Rory Wolfe, Monash University Biostatistics Collaboration of Australia School of Population Health, University of Melbourne
Subject Overview:	This subject begins with the study of probability, random variables, discrete and continuous distributions, and the use of calculus to obtain expressions for parameters of these distributions such as the mean and variance. Joint distributions for multiple random variables are introduced together with the important concepts of independence, correlation and covariance, and marginal and conditional distributions. Techniques for determining distributions of transformations of random variables are discussed. The concept of the sampling distribution and standard error of an estimator of a parameter is presented, together with key properties of estimators. Large sample results concerning the properties of estimators are presented with emphasis on the central role of the normal distribution in these results. General approaches to obtaining estimators of parameters are introduced. Numerical simulation and graphing with Stata is used throughout to demonstrate key concepts.
Objectives:	This subject will focus on applying the calculus-based techniques learned in 505-105 Mathematical Background for Biostatistics (MBB). These two subjects, together with the subsequent 505-107 Principles of Statistical Inference (PSI) unit, provide the core prerequisite mathematical statistics background required for the study of later units in the Postgraduate Diploma or Masters degree.
Assessment:	Two written assignments to be submitted during semester worth 40% each (approx 12 hours work each). Four practical written exercises to be submitted during semester worth 5% each (approx 6 hrs work each).
Prescribed Texts:	Wackerly DD, Mendenhall W, Scheaffer RL. Mathematical Statistics with Applications, 7th Edition, 2008, Duxbury Press, USA. (ISBN 978-0-495-11081-1) Special Computer Requirements: Stata Statistical Software Resources Provided to Students: Printed course notes and assignment material by mail, email, and online interaction facilities.
Breadth Options:	This subject is not available as a breadth subject.

Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Independent problem solving, facility with abstract reasoning, clarity of written expression, sound communication of technical concepts.
Links to further information:	http://www.sph.unimelb.edu.au
Notes:	This subject is not available in the Master of Public Health.
Related Course(s):	Master of Biostatistics Postgraduate Certificate in Biostatistics Postgraduate Diploma in Biostatistics