

Module Title:	Mathematics 7 – Semester 7
Academic year:	2009 - 2010
Credit Value:	6 – Mandatory
Pre- requisites:	Basic Calculus
Assessment:	100% Final Exam
Aims	This subject aims to provide students on the electronics degree programme with both the key theoretical concepts of Calculus and Stochastic Processes and an insight into practical challenges that arise in the use of these methods.
Module Content	<ul style="list-style-type: none"> • Sequence and Series • Calculus of a single variable; • Vector Calculus;
Intended Learning Outcomes:	<p>On successful completion of the module the student will be expected to be able to:</p> <ol style="list-style-type: none"> 1. Be able to test an arbitrary series of real numbers, or real power series, for convergence; 2. Be able to find derivatives of arbitrary functions of a real variable, including implicitly-defined functions; 3. Be able to find derivative of an inverse function of a real variable from the derivative function of power; 4. Be able to expand a real function as a power series; 5. Be able to integrate functions of a single real variable using special substitutions; 6. Be able to calculate a recursion formula for a function defined via an integral, using the integration by parts techniques; 7. Be able to calculate partial derivatives, and find maxima and minima, for functions of several real variables; 8. Be able to calculate gradients of scalar fields of three variables and divergence and curl of vector fields of three variables; 9. Be able to use the chain rule to relate sets of partial derivatives of functions of two variables with respect to different pairs of variables; 10. Be able to calculate multiple integrals for finding arc-lengths, areas, surface areas and volumes as well as handling changes of variables in multiple integrals.