

**School of Mathematics**

**MA1E01 — Engineering Mathematics I**  
(JF Engineers, MSISS. MEMS )

2011-12

**Lecturer:** Prof. P. Taylor

**Requirements/prerequisites:**

**Duration:**

**Number of lectures per week:** Michaelmas Term, 12 weeks

**Assessment:**

**ECTS credits:** 5

**End-of-year Examination:**

**Description:**

**Textbooks:**

**Learning Outcomes:** On successful completion of this module, students will be able to:

- Determine whether a particular map or a particular graph represents a function, take sums, differences, products, quotients and compositions of functions and find their domains and ranges.
- Compute limits of various functions by applying the laws of limits or the Squeezing Theorem and prove certain limits rigorously by applying the “epsilon-delta” formalism.
- Determine whether functions are continuous or differentiable at particular values or on particular intervals.
- Apply the various techniques of differentiation such as the product, quotient and chain rule as well as implicit differentiation.
- Solve a variety of problems involving the derivative function including finding the equation of a tangent line to a curve, related rates problems, local linear approximations, maximum and minimum problems, approximating roots and sketching curves.
- Approximate the area under a curve by Riemann sums and compute exactly the area by using the anti-derivative.
- Solve a variety of problems involving integration such as solving simple ODEs, area problems and problems involving particles in rectilinear motion.