

# MAT 2100 ANALYTIC GEOMETRY AND CALCULUS

## COURSE OUTLINE

### 1. Analytic geometry

Identify, sketch the conic sections by making the rotation of axes where necessary.

### 2. Differential calculus of equations of one variable

Find the power series of a function using the Taylor's theorem.

Apply L'Hospital's rule to compute the limit of a function.

### 3. Integral calculus of equations of one variable

Evaluate integrals using various methods of integration and apply integral calculus to find area, volume, lengths of curves, centroids and moments of inertia.

### 4. Vector analysis

Find the equation of a line and of a plane in 3D - space.

Find a unit tangent and a normal vector at a given curve.

### 5. Differential calculus of functions of several variables

Apply partial differentiation to error estimation and to stationary points problems.

### 6. Ordinary differential equations

Solve first order and second order ordinary differential equations.

**Pre-requisites:** MAT 1100 - Foundation Mathematics or A' Level Mathematics.

### Assessment

1. Continuous Assessment 30%

1.1 Assignments/Quizzes 10%

1.2 Tests 20%

2. Final Examination 70%

Total 100%

NOTE: STUDENTS SHOULD PASS BOTH THE CONTINUOUS ASSESSMENT AND THE FINAL EXAMINATION FOR THEM TO PASS THE COURSE

#### Prescribed Readings

1. Goodman A. W., (1980), *Analytic Geometry and the Calculus*, 4th Ed., Prentice Hall, ISBN: 0 023 44960 4

#### Recommended Readings

1. Finney R. L. and Thomas G. B., (1995), *Calculus and Analytic Geometry*, 9th Ed., Addison – Wesley, ISBN: 0 201 53174 9

2. Grossman S. T., (1996), *Multivariate Calculus, Linear Algebra and Differential Equations*, 3rd Ed., Academic Press, ISBN: 0 030 03038 3