

Coordinate and Vector Geometry

MA10110, MT10110

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Aim:

To develop rigorous mathematical tools to describe the “shape” of the world around us.

Content:

§1: Cartesian geometry, including points, lines, angles, curves, circles, polar coordinates, loci, and conic sections.

§2: Vectors, including basics, lines, products, planes, and kinematics.

§3: Euclidean (Axiomatic) geometry, including proofs.

MT10110 students should have access to both MA10110 and MT10110 on Blackboard.

Assessment:

There will be four assignments, two for coordinate geometry and two for vectors. These will require that you either write out answers to selected questions or complete an online multiple choice test. They will be made available in teaching weeks 2,4,6,8, due in on Mondays in weeks 3,5,7,9, with tutorials on Fridays in those weeks.

Your assignment marks and your engagement with lectures and tutorials will generate your 20% course-work mark.

There will be a 2 hour exam in January, contributing 80% of the module mark. No calculators are allowed. Past papers are available on Blackboard and the University website.

Recommended Texts:

- Weir, Hass and Giordano: Thomas' Calculus or University Calculus (QA303.T4).
- S.T. Tan: Calculus (QA303.2.T1).
- Many introductory calculus texts are useful, e.g. Stewart: Calculus (QA303.S8).
- Many engineering mathematics texts are useful, e.g. James (TA330.J2).
- For general background on geometry, I suggest Abbott's Flatland (QA699.A1.F5) and Stewart's Flatterland.

Required knowledge:

Please ensure that you are familiar with (i) calculating the determinant of a 3x3 matrix, and (ii) completing the square. Please attempt Assignment 0.

If you feel that you are struggling to understand any of the content, then you should use the help desk (times will be announced early on in the term), or read one of the books listed above, or ask me. Other revision/supplementary material is available at www.mathcentre.ac.uk