MATH0042 (Mathematical Methods in Chemistry)

Year: 2018–2019
Code: MATH0042
Old code: MATH6201
Level: 5 (UG)
Value: 15 credits (= 7.5 ECTS credits)
Term: 1
Structure: 3 hour lectures per week. Weekly assessed coursework
Assessment: 90% examination, 10% coursework
Normal Pre-requisites: MATH0040 (previously MATH6105), MATH0041 (previously MATH6106)
Lecturer: Mr M Capoferri

Course Description and Objectives

This is a course designed for second year students of chemistry, dealing with some of the mathematics useful for physical chemistry. Thus it covers series solution of ODEs, Legendre polynomials, group theory and some matrix theory. Applications of the methods to problems in Chemistry are discussed (e.g. the hydrogen atom).

Recommended Texts

Recommended books are: (i) G Stephenson, Mathematical Methods for Science Students (Longman); (ii) Kreysig, Advanced Engineering Mathematics (Wiley).

Detailed Syllabus

− Solution of partial differential equations by separation of variables. Bessel’s equation. Laplace’s equation. Wave equation.
− Three-dimensional problems with central potential. Angular momentum. Schrödinger equation for the hydrogen atom.

About 20 lectures are given and most but not all the above material is usually covered in this time.

August 2018 MATH0042