

MA42002: Mathematical Biology II Course Guide 2010 - 2011**Organisation**

The MA42002 module runs for 11 teaching weeks in the second semester. The module leader and lecturer is

Dr Niall Dodds,
Room 1.43F,
Mathematics Division,
MSI Building.

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You should make an appointment to see Dr Dodds if you have a problem regarding the course. You may bring matters of concern about the course to the attention of the Mathematics Division Staff/Student Committee, which meets once each semester. A volunteer from level 4 will act as class representative to sit on the Staff-Student Committee; their name will be posted on Blackboard.

Syllabus

In order to take this course you should have taken the module MA41002.

This is an optional module for students who wish to graduate with a Mathematics degree or any Joint Honours degree involving Mathematics. This is a compulsory module for students who are taking the degree in Mathematical Biology. The course follows on from MA41002 and focuses on biological systems which can be modelled using nonlinear partial differential equations.

Course Content*Partial Differential Equation Models*

Introduction to partial differential equation models in biology; the diffusion equation; reaction-diffusion equations. Fisher's equation and travelling wave solutions of reaction-diffusion equations. Turing pre-pattern theory with applications to animal coat patterns and morphogenesis. Mechanochemical pattern formation theory. Epidemiological models.

Assessment

There will be two class tests during the semester which count for 10% each, and the remaining 80% will come from the degree examination, which will be held in the May diet of Degree Examinations. Honours degree examinations will be two hours in length. The pass mark will be 40% overall.

If you are unable to attend an element of assessment (such as a Class Test or a Degree Examination because of illness, **you must supply a medical certificate** covering the relevant period to your School Office. If illness prevents you from attending other

meetings of the class, please keep your School Office informed of the reasons for your absence.

Feedback

At the end of each section of the module you will be asked to complete a confidential questionnaire regarding the content and presentation of the module. This is an important element in the University's Academic Standards procedures.

Recommended Books

N. F. Britton *Essential Mathematical Biology*

J. D. Murray *Mathematical Biology*

Note: You are not recommended to buy the book by Murray, as about 2/3 of the course is covered in Britton's book, and Murray's book is rather expensive. Murray's book may however be useful at times, and copies can be found in the library.