



The University of Southern Queensland

Course specification

Description: Advanced Low-Dimensional Modelling of Complex Systems						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
MAT	8104	45069	2, 2005	ONC	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS003
Student contribution band:	2
ASCED code:	010101

STAFFING

Examiner: Tony Roberts
Moderator: Dmitry Strunin

REQUISITES

Pre-requisite: MAT4102 and as advised by the examiner

RATIONALE

Most physical situations and complex systems of interest in the world around us have an enormous number of fine details which are of little concern in many situations. The practical equations which scientists deal with are simplifications of the "true" but intractable or overly-complicated equations that describe all the fine detail. Just one example is the derivation of a numerical model for simulation. The process of creating simple model approximations for otherwise intractably detailed dynamical descriptions, sometimes called dimensional reduction, is addressed in this Course.

SYNOPSIS

This course flexibly combines aspects of modern dynamical systems theory with numerical techniques, fluid dynamics and other application areas. We develop how to derive relatively simple dynamical models in the application of the techniques to important classes of applications. The principles of the modelling process that are developed apply universally to any evolving system. The triple aim is to explore: algebraic techniques; general modelling principles; and application areas. This course is normally offered only in even years.

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
TO BE ADVISED	100.00	100.00	19 Jul 2005