

## **MATH5215 Dynamic Equations on Time Scales**

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This subject offers an introduction to the new and exciting area of “dynamic equations on time scales”. The theory of time scales utilises, enhances and extends ideas from differential and difference equations. Investigations into the time scales theory highlights the rich distinctions and the common bonds between the continuous (differential equations) and the discrete (difference equations). The subject of time scales is ideal for modeling stop-start processes where continuous and discrete time may feature in the one model.

The course will equip students to make potential research contributions to the field of dynamic equations on time scales. Students will also gain an appreciation of the similarities and differences between continuous and discrete dynamic equations.

This subject is a first for Australian universities.

The course is split into two main (and complementary) areas:

- DIFFERENCE EQUATIONS:
- the difference calculus
- linear difference eqns
- stability theory
- self-adjoint eqns
- boundary value problems
- THE TIME SCALES:
- time scale calculus
- linear dynamic eqns
- Miscellaneous research-inspired topics including open problems

Lectures are: MON 11 and TUE 3, both in RC-3085

### Assessment

The assessment is: An 80% end session exam and a 20% assignment (see below).

### Assignment

Let  $n$  be the number of students obtaining a grade in MATH5215, S1, 2005 and let  $z$  be the smallest integer  $\geq 26/n$ .

(i) Provide a clean, neat, detailed and legible (handwritten) copy of the notes from  $z$  specially assigned MATH5215 lectures. This is to be submitted to RC-4103.

(ii) Scan the hard-copy to form an electronic copy and email as an attachment to *cct@maths.unsw.edu.au*.

An appropriate roster system will be organised to determine the specific lectures for each student to submit. Lecture notes for each appropriate lecture need to be submitted within 7 days after the aforementioned lecture. There are no part-marks for this assignment.