

Course Name

Introduction to Control and Signals Processing

Course Description

The course will provide an overview of the important analytical tools and techniques required for research in the areas of Control and Signal processing being undertaken by CSP research group. The course will also outline the major problems being addressed in the areas of Large Scale Dynamical Systems and Life Sciences.

Day 1 – Monday 28 November 2011

Lecture 1 (9am – 10am)

Overview of CSP concepts and problems (Evans/Caelli)

Lecture 2 (10am – 11am)

Dynamical Systems, Feedback and Stability (Iven Mareels)

Lecture 3 (11am – 12am)

Introduction to Estimation Theory (Adrian Bishop)

Lunch (12am-1pm)

Lecture 4 (1pm – 2pm)

Concepts in Optimal Control (Liuping Wang)

Lecture 5 (2pm – 3pm)

Introduction to Large Scale Systems (David Hill)

Lecture 6 (3pm – 4pm)

Multi-sensor Estimation and Fusion (Subhash Challa)

Homework: Matlab Exercises 1 (4pm – 6pm)

Day 2 – Tuesday 29 November 2011

Lecture 7 (9am – 10am)

Signal Processing: Transforms and Inverse Problems (Rob Evans)

Lecture 8 (10am – 11am)

Algorithms for Genome Assembly (Bryan Beresford-Smith)

Lecture 9 (11am – 12am)

Statistical Methods for Gene Expression Analysis (Kowalczyk)

Lunch (12am-1pm)

Lecture 10 (1pm – 2pm)

Control models for cell behaviour (Rajib Chakravorty)

Lecture 11 (2pm – 3pm)

Wireless kinematics: encoding and recognition methods (Tharshan Vaithianathan)

Lecture 12 (3pm – 4pm)

Ontologies, Indexing and classification for health data (Sanderson)

Homework: Matlab Exercises 2 (4pm – 6pm)