

[DESC9105 - Neural Network Models and Applications - 6 credit points](#)

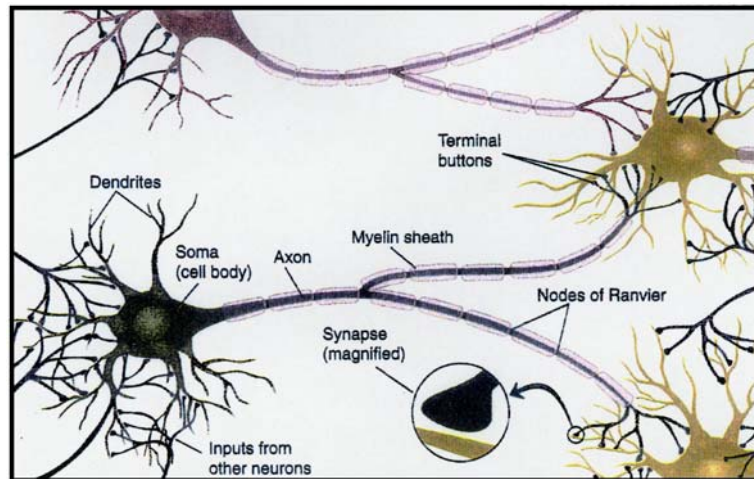
A postgraduate unit of study offered in semester 1, 2003

*In*

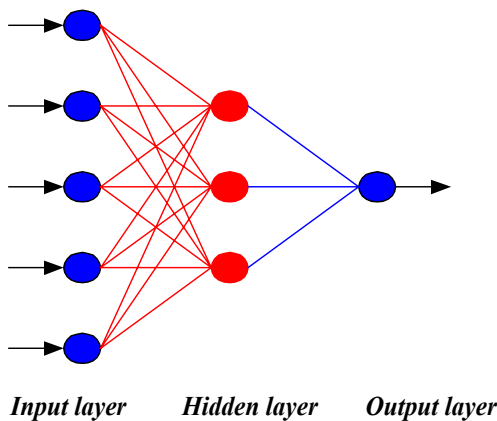
Architecture Lecture Theatre 3 & Design Computing Laboratory (Room 286)

*On*

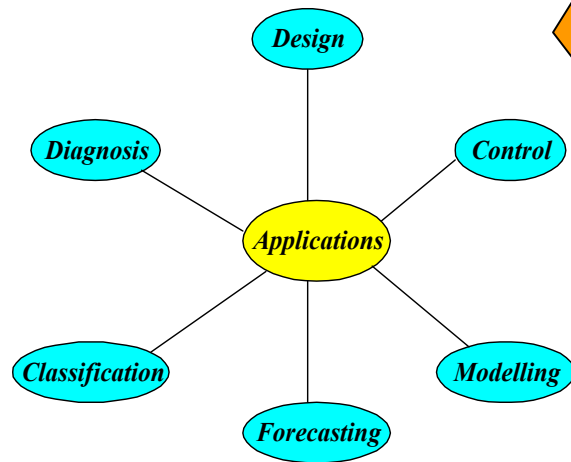
Thursdays 6.00 – 9.00pm



*Biological Neurons*



*Artificial Neural Network*



*Applications – Problem Types*

Neural networks are computational models derived from the structure and function of the human brain. It is one of the emerging computing paradigms that has found extensive applications in a number of subject areas within a variety of disciplines.

The unit is designed to provide a framework for understanding the considerable development that is taking place in this area and experience in the use of state-of-the-art neural network softwares to develop neural network models for specific applications. It is aimed at professionals who wish to use this computing paradigm within their application areas, and graduate students who wish to explore the potential for this approach within their research disciplines. Information on the unit is given below.

## Neural Network Models and Applications

### 6 Credit points

*Classes* lectures and computer laboratory sessions

*Assessment* assignments

### *Objectives*

The unit aims to:

- introduce students to a number of neural network computational models available for solving a variety of generic problems
- explore and identify the existence of these generic problems in a number of application areas within different disciplines
- investigate the different pre-processing techniques available for improving the learning and generalisation capabilities of neural networks
- explore the different methods available for selecting the neural network model characteristics for a given application
- present the basis for a number of the learning algorithms available for some of the widely used neural network models

### *Outcomes*

At the completion of the unit each student is expected to:

- have a good understanding of the characteristics and capabilities of a number of neural network models
- be able to associate a problem in a given application area with a generic problem class and select an appropriate neural network model
- be cognisant of the theoretical bases for the features available in a number of the neural network simulation tools
- be familiar with the latest developments in neural network modelling procedures
- be able to develop neural network models for applications within their own disciplines

The above outcomes provide the basis for the different assessment tasks.

The unit is organised around three areas: neural network basics, models and applications. In addition to providing the theoretical bases for the different models and modelling procedures, the course also explores the latest developments and refinements to some of the well established models, particularly in the areas of pre-processing of data and learning algorithms. It provides hands-on experience in the use of state-of-the-art neural network software. Assignments are designed to provide experience both in developing neural network models for generic problems and for solving problems within the student's own discipline.

**For further details contact:**

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