MATH 7017 PROBABILISTIC GRAPHICAL MODELS

Credit Points 10

Legacy Code 301365

Coordinator Oliver Obst (https://directory.westernsydney.edu.au/search/name/Oliver Obst/)

Description Modelling data provides us with a method for inference, but there are many occurrences when interest lies in the reasoning behind the decision making. In this subject, students learn to model processes and the reasoning behind the processes using probabilistic graphical models. The subject investigates the construction and application of model-based approaches for complex systems. Students will manually create models based on prior knowledge and investigate methods of learning model structures from data, which can be used to make decisions under uncertainty. Topics covered include Monte Carlo Methods, Decision Theory, Bayesian networks, Markov networks, and the use of information theory.

School Computer, Data & Math Sciences

Discipline Statistics

Student Contribution Band HECS Band 1 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Postgraduate Coursework Level 7 subject

Pre-requisite(s) MATH 7016

Assumed Knowledge

Probability, Linear Algebra, Basic Programming.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Manually construct probabilistic models for specific data.
2. Automatically construct probabilistic models by learning from data.
3. Use the models to make decisions under uncertainty.
4. Accurately represent a probabilistic model using a graphical representation.

Subject Content

1.Network representation and graphical models
2.Probabilistic models and entropy
3.Inference in graphical models
4.Learning graphical models

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Quiz	6x40min	30	N	Individual	Y
Applied Project	15 pages	40	N	Individual	Y
Intra-session Exam	2 hours	30	N	Individual	Y

Teaching Periods

Autumn (2025)

Parramatta - Victoria Rd

On-site

Subject Contact Oliver Obst (https://directory.westernsydney.edu.au/search/name/Oliver Obst/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH7017_25-AUT_PS_1#subjects)