

COMP 3032 MACHINE LEARNING

Credit Points 10

Legacy Code 301435

Coordinator Yi Guo ([https://directory.westernsydney.edu.au/search/name/Yi Guo/](https://directory.westernsydney.edu.au/search/name/Yi%20Guo/))

Description Machine Learning is one of the most important technologies in the fields of Artificial Intelligence and Data Science used to explain large datasets, inform decisions and highlight risks. Machine Learning is relevant for solving a range of problems in many industries dealing with significant amounts of information and the structure of that information. In this unit, students put Machine Learning theory into action through widely used algorithms and practical applications for designing, training, and evaluating common learning models and systems. Students use Python programming and, as a result, learn about its important machine learning libraries and packages, such as Scikit-Learn, Keras and TensorFlow for solving practical problems and tasks.

School Computer, Data & Math Sciences

Discipline Artificial Intelligence

Student Contribution Band HECS Band 2 10cp

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

Level Undergraduate Level 3 subject

Pre-requisite(s) MATH 1028 OR

MATH 1033 OR
MATH 1003 OR
MATH 1030 AND
COMP 1005 OR
MATH 1002 OR
COMP 3002

Learning Outcomes

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

1. Apply machine learning tasks such as clustering, dimensionality reduction, regression and classification.
2. Apply machine learning workflow when evaluating learning systems for given tasks.
3. Determine appropriate machine learning models and algorithms in various scenarios.
4. Apply Python programming skills and tools for solving common machine learning application problems.

Subject Content

1. Introduction to Machine Learning
2. Supervised Learning: Regression and Classification
3. Model Selection
4. Unsupervised Learning: Clustering, Dimensionality Reduction and Manifold Learning
5. Non-parametric methods, Tree based Methods, and Support Vector Machines
6. Deep Learning: Foundations of Neural Networks, Autoencoder, CNNs, GANs
7. Reinforcement Learning

8. Python based machine learning libraries, packages and applications

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.

Item	Length	Percent	Threshold	Individual/Group Task
Intra-session Exam	2 hours	40	Y	Individual
Practicals	2 hours (per practical)	15	N	Individual
Practicals	4 hours (per practical)	45	N	Individual

Prescribed Texts

- Alpaydin, E. (2020). Introduction to machine learning (4th ed.). MIT Press.

Teaching Periods

Spring Penrith (Kingswood)

Day

Subject Contact Yi Guo ([https://directory.westernsydney.edu.au/search/name/Yi Guo/](https://directory.westernsydney.edu.au/search/name/Yi%20Guo/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=COMP3032_22-SPR_KW_D#subjects)

Parramatta - Victoria Rd

Day

Subject Contact Yi Guo ([https://directory.westernsydney.edu.au/search/name/Yi Guo/](https://directory.westernsydney.edu.au/search/name/Yi%20Guo/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=COMP3032_22-SPR_PS_D#subjects)