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Title: Autonomous Systems and Machine Learning  
Status: Definitive  
Code: **6513ELEM**M (128374)  
Version Start Date: 01-08-2021  
Owning School/Faculty: Engineering  
Teaching School/Faculty: Auston College Myanmar, Yangon, Myanmar

Team	Leader
Qian Zhang	Y

**Academic Level:** FHEQ6      **Credit Value:** 20      **Total Delivered Hours:** 46  
**Total Learning Hours:** 200      **Private Study:** 154

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	11
Practical	33

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Examination	50	2
Report	AS1	Practical and Design	50	

### Aims

*The aim of this module is to study the fundamentals of computational intelligence (CI) and their potential applications in robotics, and practise some CI-based techniques in the planning and control problems.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse the techniques of computational intelligence (CI) and explain their strengths and weaknesses.
- 2 Use CI techniques to solve modern engineering and robotic problems.
- 3 Apply suitable autonomous system based solutions to modern automation problems
- 4 Design and implement machine learning systems

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	1	2	3	4
Practical and Design	3	4		

## Outline Syllabus

*Review of CI, Autonomous Systems, Mobile Robots, Robotic Arms. Optimisation, Searching, Heuristic Algorithms, Swarm Intelligence, Generic Algorithms, Particle Swarm Optimisation. Modelling, Data-driven, Artificial Neural Networks, Back Propagation, Deep Networks, Fuzzy Rule-based Systems, Interpretability, Black-box systems. Artificial Intelligence, Machine Learning, Classification, Clustering, Big Data. Planning Algorithms, Motion Planning, Path Planning, Decision Theory, Decision Tree.*

## Learning Activities

Lecture, demonstration and practical activities applying topics discussed.

## Notes

In this module, students study the fundamentals of computational intelligence and their potential applications in robotics through both lectures and practical application.