

Summary Information

Module Code	7144COMP
Formal Module Title	Deep Learning Concepts and Techniques
Owning School	Computer Science and Mathematics
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Carl Chalmers	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Basma Abdulaimma	Yes	N/A
Paul Fergus	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	11
Tutorial	11

Module Offering(s)

Offering Code	Location	Start Month	Duration
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To develop knowledge of effective and academic understanding of deep learning at masters level and provide guidance on the purpose, design and development of deep learning projects. To provide an understanding of how the range of tools, techniques and algorithms can be most appropriately applied. To provide help on establishing best practice deep learning design and development principles to successfully complete a deep learning project.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Demonstrate a critical understanding of the theoretical principles and objectives of Deep Learning (DL)
MLO2	Critically assess and select a range of DL concepts and techniques.
MLO3	Critically select appropriate DL algorithms and architectures to solve particular tasks
MLO4	Implement and test different DL algorithms and architectures using Python and associated frameworks
MLO5	Evaluate DL algorithms and architectures to determine their strengths and weaknesses

Module Content

Outline Syllabus
1. Introduction to Deep Learning 2. Multi-Layer Perceptions 3. Gradient Descent and Backpropagation 4. Hyper-parameter optimisation 5. Supervised Learning (Artificial Neural Networks) 6. Unsupervised Learning (Stacked Autoencoders) 7. Convolutional Neural Networks 8. Training, Evaluation and Regularisation 9. Optimisation 10. Deployment and Hosting 11. Applications in Deep Learning; Limitations and New Frontiers

Module Overview

This module provides fundamental skills required in deep learning to conduct a wide variety of projects from signal processing to object detection and segmentation.

Additional Information

This module provides fundamental skills required in deep learning to conduct a wide variety of projects from signal processing to object detection and segmentation. These skills will help to equip the student with the key principles of deep learning to support advanced topics taught in the course. Furthermore, these skills will be practical core requirements for a successful career as a deep learning practitioner in industry.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Report	Report	40	0	MLO1, MLO2
Technology	Prototype	60	0	MLO3, MLO5, MLO4