Module Proforma

Approved, 2022.05

Summary Information

Module Code	7143COMP
Formal Module Title	Foundations of Machine Learning
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
Paul Fergus	Yes	N/A

Module Team Member

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

Partner Module Team

Contact Name	Applies to all offerings	Offerings

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 and an understanding of machine learning at masters level and provide guidance on the design and development of machine learning projects using both theory and practice.To provide an understanding of a range of tools, techniques, algorithms, and data processing approaches.To critically evaluate machine learning methodologies and their appropriate use to solve real-world problems.

Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Demonstrate advanced understanding of the theoretical principles and objectives of Machine Learning (ML)
MLO2	Critically evaluate and apply advanced ML concepts and techniques
MLO3	Select appropriate ML algorithms to solve particular tasks
MLO4	Critically evaluate ML algorithms to determine their strengths and weaknesses
MLO5	Implement, validate and test different ML algorithms introduced in the module using Python and associated frameworks

Module Content

Outline Syllabus
1. Machine Learning Fundamentals2. Data Engineering3. Unsupervised Learning4. Supervised Learning5. Linear Regression6. Logistic Regression7. Random Forests and Ensemble Methods 8. Support Vector Machines9. Dimensionality Reduction10. Feature Engineering11. Performance, Validation and Model Interpretation; Large Scale Machine Learning

Module Overview

This module provides fundamental skills required in machine learning to solve real-world problems. These skills will help to equip the student with the fundamental principles of machine learning to support advanced topics taught in the course. Furthermore, these skills will be practical core requirements for a successful career as a machine learning engineer in industry.

Additional Information

This module provides fundamental skills required in machine learning to solve real-world problems. These skills will help to equip the student with the fundamental principles of machine learning to support advanced topics taught in the course. Furthermore, these skills will be practical core requirements for a successful career as a machine learning engineer in industry.

Assessments

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