

### Summary Information

Module Code	7506BDSA
Formal Module Title	High Performance Computing
Owning School	Computer Science and Mathematics
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

### Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

### Learning Methods

Learning Method Type	Hours
Lecture	45
Practical	30

### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

### Aims and Outcomes

Aims	The course provides students with a comprehensive knowledge about the principles of high performance computing (HPC) to handle big data considering their five dimensions known as the 5Vs (Volume, Variety, Velocity, Variability, and Veracity). It covers distributed data processing with Hadoop and MapReduce, the surveys and architectures of cloud computing platforms, the scaling data science techniques and algorithms, and the performance enhancement by calculating the number of processors needed to perform a particular task. The companion practical sessions of the course focus on writing programs and building a node-compute-cluster.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Demonstrate comprehensive knowledge in HPC.
MLO2	2	Conduct research activities in several areas related to HPC involving parallel programming, cloud computing and cluster computing.
MLO3	3	Implement advanced skills for enhancing computer performance.
MLO4	4	Identify and formulate practical problems in Distributed data processing.
MLO5	5	Apply advanced software to acquire practical experience in writing concurrent programs and building node computer cluster.

### Module Content

Outline Syllabus	Introduction to HPC Big Data 5Vs Distributed Data Processing with Hadoop & MapReduce Survey & Architectures of Cloud Computing Platforms Scaling Data Science Techniques & Algorithms Performance Enhancement Flynn's taxonomy SISD, MISD, SIMD, MIMD Vector Computing Parallel Programming Cluster Computing Types of Super Computers
Module Overview	
Additional Information	The module contributes to the master's aim to equip the student with the required abilities and skills to perform data science on real-world applications.

### Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Assignments/Exercises	30	0	MLO3, MLO4, MLO5
Report	Report & Presentation	30	0	MLO2, MLO3, MLO4, MLO5
Exam	Final Examination	40	3	MLO1, MLO3, MLO4

### Module Contacts

#### Module Leader

Contact Name	Applies to all offerings	Offerings

Sandra Ortega Martorell	Yes	N/A
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**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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