F21DP Distributed & Parallel Technologies

COURSE DETAILS

Course Code: F21DP
Full Course Title: Distributed & Parallel Technologies
SCQF Level: 11
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL

Undergraduate: Yes  Postgraduate Taught: Yes  Postgraduate Research: No

Additional Information:

COURSE AIMS

• To explore technologies and techniques underlying advanced software development for parallel and distributed systems.
• Review the principal abstractions, methods and techniques used in distributed and parallel programming.
• Develop an understanding of parallel programming on heterogeneous architectures including accelerators such as GPUs
• Enable students to appreciate critically a range of distributed and parallel computing technologies

LEARNING OUTCOMES – SUBJECT MASTERY

• Understanding of foundational concepts of distributed and parallel software
• Knowledge and application of contemporary techniques for constructing practical distributed and parallel systems using both declarative and imperative languages
• Parallel performance tuning using appropriate tools and methodologies
• Understand the role of control and data abstraction in software design and implementation
• Appreciation of relationship between imperative and declarative models of parallelism

LEARNING OUTCOMES – PERSONAL ABILITIES

• Critically analyse parallel and distributed problems.
• Generate, interpret and evaluate parallel performance graphs
• Develop original and creative parallel problem solutions
• Showing initiative, creativity and team working skills in shared distributed and parallel application development.
• Demonstrate critical reflection, e.g. understanding of applicability of, and limitations to, parallel and distributed systems

SYLLABUS

Foundations of sequential and parallel programming; the role of sequential host languages in the context of distributed and parallel technologies. Distributed Technologies: Distribution concepts; low-level, mid-level and high-level distributed technologies; emerging distribution and coordination technologies. Parallel Technologies: Design of parallel systems, parallel performance analysis; programming heterogeneous systems; practical imperative parallel programming; practical declarative parallel programming
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Reassessment for Postgraduates only

Prerequisites: Academic knowledge of fundamentals of operating systems, computer networks and software engineering equivalent to an ordinary degree in Computer Science, basic knowledge of programming in C

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