### COURSE DETAILS

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

### DELIVERY LEVEL

<table>
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<tr>
<th>Undergraduate:</th>
<th>Yes</th>
<th>Postgraduate Taught:</th>
<th>Yes</th>
<th>Postgraduate Research:</th>
<th>No</th>
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**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.
F21DP Distributed & Parallel Technologies

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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<tr>
<th>COURSE RELATIONSHIPS</th>
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<th>LOCATION AND ASSESSMENT METHODS</th>
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