F21AS Advanced Software Engineering

**COURSE DETAILS**

- **Course Code:** F21AS
- **Full Course Title:** Advanced Software Engineering
- **SCQF Level:** 11
- **SCAF Credits:** 15
- **Available as Elective:** No

**DELIVERY LEVEL**

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**Additional Information:**

**COURSE AIMS**

- To consolidate proficiency in imperative programming and software development
- To further develop object oriented programming and object oriented design methods
- To provide knowledge of simple data structures and algorithms
- To introduce concurrent programming techniques
- To instil understanding of the concepts and benefits of advanced software engineering methods
- To give further practical experience of the use of UML in software engineering
- To give practical experience of developing a substantial software engineering team project
- To enable the deployment of patterns in software engineering

**LEARNING OUTCOMES – SUBJECT MASTERY**

- Skill in the use of UML notation and translation of UML designs to working programs
- Understanding of basic data structures and algorithms and ability to critically evaluate their appropriateness and limitations for a range of moderately complex problems.
- Demonstration of skill in design and implementation of practical GUI based and threaded applications
- To demonstrate a critical understanding of modern software engineering practice and be able to evaluate the strengths and weaknesses of current software engineering methods and techniques
- To be able to choose appropriate metrics to measure software quality and quantity in a modern software engineering environment
- To be able to choose a suitable software development environment and development methodology for specific software development tasks and justify the choice

**LEARNING OUTCOMES – PERSONAL ABILITIES**

- Appreciation of use of methodology to ground system analysis, design and development
- Understanding of different programming paradigms and their inter-relation
- Practice in working in a group, choosing a methodology, reaching a consensus, and working with others to a deadline
- Taking responsibility for own work, taking responsibility in the development of resources, critical reflection on development process and work undertaken by self.
- Effective appreciation of professional standards in modern software engineering practice.
- Showing initiative, creativity and team working skills in collaborative software development

**SYLLABUS**
F21AS Advanced Software Engineering

Data structures: stacks, queues, lists, priority queues, binary trees
Algorithms: searching (linear and binary) and sorting
Advanced object oriented design techniques
Thread based programming: thread creation and interaction, shared variables and synchronisation
Methodologies in software engineering practice; Unified Modelling Language; design patterns;
Project planning and management in software engineering;
Comparison of agile and plan driven approaches

Prerequisites: Knowledge of Java programming and software engineering at undergraduate level

COURSE RELATIONSHIPS

<table>
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<tr>
<th>Course Code</th>
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<th>School</th>
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LOCATION AND ASSESSMENT METHODS

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