F20RS Rigorous Methods for Software Engineering

COURSE DETAILS
Course Code: F20RS
Full Course Title: Rigorous Methods for Software Engineering
SCQF Level: 10
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No
Additional Information:

COURSE AIMS
To provide knowledge and understanding of tools and techniques which support rigorous software engineering

LEARNING OUTCOMES – SUBJECT MASTERY

- Knowledge and understanding of a range of rigorous processes and formal methods that support the development of high integrity software systems.
- Critical understanding of the relationship between code level annotations and high-level formal specifications.
- Knowledge of the mechanisms that underlie advanced modelling and static analysis techniques.
- To be able to demonstrate a critical understanding of the relationship between code level annotations and flow analysis techniques.
- To be able to demonstrate a critical understanding of program proof and how it can be used to provide strong formal correctness guarantees.

LEARNING OUTCOMES – PERSONAL ABILITIES

- Conceptualize and define new abstract problems within the context of automated software development.
- Make informed judgements in situations in the absence of complete or consistent data.
- Exercise autonomy, initiative and creativity in the application of software engineering techniques.
- Demonstrate critical reflection. (PDP)
- Communicate with professional level peers, senior colleagues and specialists. (PDP)

SYLLABUS
The course addresses the challenges of engineering and modelling safe and secure software systems. It covers a range of rigorous processes and formal methods that support the development of high integrity software systems. From modelling and reasoning about designs through to code, students will experience a range of state-of-the-art static analysis tools and techniques. While theory based, the course has a strong practical element, drawing upon industrial case study material where appropriate.

COURSE RELATIONSHIPS
Course Code | Level | Title | School |
-------------|-------|-------|--------|
F28SD | 8 | Software Design | School of Math and Comp Sci. |
| Type | Pre-Requisite |

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## LOCATION AND ASSESSMENT METHODS

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