COURSE DETAILS
Course Code: F29FB
Full Course Title: Foundations 2
SCQF Level: 9
SCAF Credits: 15
Available as Elective: No

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

COURSE AIMS
- To ensure students correctly understand the needed mathematics, in particular: functions and how to logically specify them.
- To understand computability.
- To understand a specific model of computability: Turing machines.
- To understand the limits of computability and how we know these limits.

LEARNING OUTCOMES – SUBJECT MASTERY
- Understanding functions and gaining competence with recognizing, specifying, and using them.
- Understanding how computation and its limits are mathematically modeled and reasoned about.

LEARNING OUTCOMES – PERSONAL ABILITIES
- Awareness of the limits of computing and how to assess whether a problem is solvable at all.
- Increased fluency in reading theoretical research in the field.

SYLLABUS
Mathematical background; enumerability; countable and uncountable sets; diagonalization; Gödel numbering; Turing machines (TMs); computable and uncomputable functions; Turing computability; the Halting Problem; solvability and reduction of decision problems; Church’s thesis and effective computability; nondeterministic TMs; $P = NP$?

COURSE RELATIONSHIPS
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<th>School</th>
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LOCATION AND ASSESSMENT METHODS
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F29FB Foundations 2

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