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>Title</th>
<th>School</th>
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<td>School of Math and Comp Sci.</td>
<td>Pre-Requisite</td>
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LOCATION AND ASSESSMENT METHODS

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