COURSE DETAILS
Course Code: F11MT
Full Course Title: Modelling and Tools
SCQF Level: 11
SCAF Credits: 15
Available as Elective: No

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

The course aims to provide postgraduate students with a knowledge and critical understanding of applied mathematics and tools for solving mathematical problems

LEARNING OUTCOMES – SUBJECT MASTERY
By the end of the course, students should be able to:

• develop appropriate Python programs to investigate and visualise mathematical problems.
• deal with fundamental deterministic and probabilistic modeling techniques and the application of these to real-life problems.
• understand Random variables, Mean, Variance, Covariance, independence
• understand Standard distributions - eg Normal, uniform, Poisson.
• understand the Central Limit Theorem, Law of Large Numbers
• perform basic Monte-Carlo simulations and Gillespie type simulations.

LEARNING OUTCOMES – PERSONAL ABILITIES

• Demonstrate the ability to learn independently
• Demonstrate knowledge of an area of mathematics.
• Manage time, work to deadlines and prioritise workloads

SYLLABUS
Introduction to Python: Providing/reviewing the basics of Python. This will include labwork. This will allow the development of appropriate Python programs in the following sessions.


Review of probability theory, Modelling and Simulation: Basic probability and random variables. Examples such as random
walks and optimal stopping. Using Python to solve probability problems.

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