F78AP Algorithmic and Scientific Programming

COURSE DETAILS
Course Code: F78AP
Full Course Title: Algorithmic and Scientific Programming
SCQF Level: 8
SCAF Credits: 7.5
Available as Elective: No

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

COURSE AIMS
- To introduce the use of algorithms to solve computational problems
- To equip students with fundamentals of computer programming; skills and techniques which may be applied in a wide variety of programming languages
- To have students create algorithms to solve computational problems in at least two programming languages used in modern data science (such as R and Python)

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

- design and implement appropriate algorithms to solve computational problems
- understand the logical operation of computer programmes
- use appropriate control structures, loops and conditional statements within computer programmes
- use appropriate data structures within computer programmes

At the end of this course, students should be able to:

- systematically analyse the structure and operation of unfamiliar algorithms and computer programmes
- design algorithms and programmes to solve unfamiliar computational problems

LEARNING OUTCOMES – PERSONAL ABILITIES
At the end of this course, students should be able to:

- use appropriate algorithms and computer programmes to solve problems relevant to modern data science and related industries

At the end of this course, students should be able to:
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- apply their understanding of computer programming to independent study of unfamiliar programming languages

At the end of this course, students should be able to:

- design and implement appropriate algorithms to solve mathematical and statistical problems
- use appropriate software to write and execute computer programmes
- write computer code understandable to other users

SYLLABUS

- Introduction to computational algorithms
- Conditional statements: if, else
- Loops: for, while
- Writing functions
- Recursion
- Vectors, arrays and matrices
- Graphics

Students will study the above using at least two programming languages (e.g. R and Python)

COURSE RELATIONSHIPS

N/A

LOCATION AND ASSESSMENT METHODS

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