CS131-15 Mathematics for Computer Scientists 2

24/25

Department
Computer Science
Level
Undergraduate Level 1
Module leader
Yulia Timofeeva
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module follows on from CS130 Mathematics for Computer Science 1

Module aims

The module aims to provide students with sufficient mathematical knowledge to enable them to understand the foundations of their subject for both study purposes and later career development. It seeks to bridge the gap in style and content between A-level and university mathematics, and to introduce students to the language and methods of professional mathematics.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. Number Systems: integers, conversion algorithms, modular arithmetic, real numbers, axioms, complex numbers.

2. Linear Algebra: vectors, linear independence, subspaces, basis, dimension. Matrix algebra: linear equations, inverses, linear transformations, eigenvalues/vectors.
3. Sequences and Series: limit and convergence properties of sequences and series.
4. Calculus: Limits, continuity, differentiable functions, differentiation of inverse functions, integration, logarithms, exponentials, Taylor's theorem.

Learning outcomes

By the end of the module, students should be able to:

- - Carry out formal and informal mathematical proofs.
- - Use effectively techniques for the analysis and transformation of vector spaces and the solution of sets of linear equations.
- - Perform operations of the differential and integral calculus with confidence and precision.
- - Apply conversion algorithm between different number systems, understand concept of a complex number and its properties

Indicative reading list

Please see Talis Aspire link for most up to date list.

View reading list on Talis Aspire

Subject specific skills

- Critical thinking
- Problem solving
- Quantitative reasoning
- Analytical thinking
- Construction of logical arguments

Transferable skills

- Critical thinking
- Technical
- Good working habits of being thorough and independent
- Creativity

Study

Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Seminars	9 sessions of 1 hour (6%)
Private study	111 hours (74%)
Total	150 hours

Private study description

Weekly revision of lectures' material
Solving non-assessed exercises (week 1, week 2, week 4, week 6, week 8)
Solving assessed problem sheets (week 3, week 5, week 7, week 9)
Preparation for exam (solving past exam papers)

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group D2

	Weighting	Study time	Eligible for self-certification
Assigned problem sheet Problem sheet 1	3%		Yes (waive)
Problem Sheet 2	3%		Yes (waive)
Problem Sheet 3	4%		Yes (waive)
Problem Sheet 4	10%		Yes (extension)
In-person Examination	80%		No

- Answerbook Pink (12 page)

Assessment group R1

	Weighting	Study time	Eligible for self-certification
In-person Examination - Resit	100%		No

	Weighting	Study time	Eligible for self-certification
CS131 resit exam			

- Answerbook Pink (12 page)

Feedback on assessment

Feedback on problem sheets given in seminars.

Past exam papers for CS131

Availability

Pre-requisites

This module follows on from CS130

Courses

This module is Core for:

- Year 1 of UCSA-G500 Undergraduate Computer Science
- UCSA-G503 Undergraduate Computer Science MEng
  - Year 1 of G500 Computer Science
  - Year 1 of G503 Computer Science MEng
- Year 1 of UCSA-I1N1 Undergraduate Computer Science with Business Studies