

## MODULE SPECIFICATION

- 1 **The title of the module**  
CO325 Foundations of Computing II
- 2 **The Department which will be responsible for management of the module**  
Computer Science
- 3 **The Start Date of the Module**  
September 2004
- 4 **The cohort of students to which the module will be applicable.**  
2009/2010
- 5 **The number of students expected to take the module**  
100
- 6 **Modules to be withdrawn on the introduction of this proposed module and consultation with other relevant Departments and Faculties regarding the withdrawal**  
None.
- 7 **The level of the module (eg Certificate [C], Intermediate [I], Honours [H] or Postgraduate [M])**  
C
- 8 **The number of credits which the module represents**  
15
- 9 **Which term(s) the module is to be taught in (or other teaching pattern)**  
Spring
- 10 **Prerequisite and co-requisite modules**  
Prerequisite: CO322
- 11 **The programmes of study to which the module contributes**  
BSc Computer Science (all variants),.
- 12 **The intended subject specific learning outcomes and, as appropriate, their relationship to programme learning outcomes**  
It is expected that upon completion of the module students should
  - Have developed a knowledge and understanding of, and the ability to apply the mathematical principles and concepts behind topics that comprise the CS programmes.
  - Have developed formal reasoning skills that will be required elsewhere in the degree programmes in which this module is taken.
  - Have basic understanding of Propositional and Predicate Logic: their syntax (connectives, quantifiers) and their semantics (truth tables, logical equivalences).
  - Be able to write and evaluate expressions in Propositional and Predicate Logic.
- 13 **The intended generic learning outcomes and, as appropriate, their relationship to programme learning outcomes**  
It is expected that upon completion of the module students should
  - Have developed mathematical problem solving and analysis skills.
  - Have developed numeracy skills to understand and explain the quantitative dimensions of a problem (programme outcome D4).
  - Have exercised self-management of their own learning (programme outcome D5).
  - Have developed generic skills relating to computational thinking (programme outcome B7).
- 14 **A synopsis of the curriculum**
  - Geometry: Cartesian co-ordinates, equation of a line, two-dimensional polar co-ordinates, parametric equations of a circle, vectors, linear transformations, matrices.
  - Differential calculus: gradients, Leibnitz notation, differentiation of simple functions, maxima and minima, graph sketching.
  - Integration: integration as the reverse of differentiation, areas, trapezium rule, Simpson's rule.
  - Probability: permutations and combinations, outcome spaces, equiprobable events, calculations of probability in simple cases, conditional probability, Bayes' theorem, independence, expectation.

- Logarithmic and Exponential functions: differentiation, rates of growth, O-notation.
- Propositional Logic: syntax, abstract syntax, truth tables, Predicate Logic: quantifiers, scope and renaming. Equivalences in either logic, e.g., de Morgan rules.

**15 Indicative Reading List**

- Clarke G & Cook D, A basic course in statistics, Hodder Arnold, 1998.
- Croft & Davison, Foundation Maths, Prentice Hall, 2003.
- Dean N, The Essence of Discrete mathematics, Prentice Hall.
- Nissanke N, Introductory Logic and Sets for Computer Scientists, Addison Wesley.
- Page SG, Mathematics: a second start, Ellis Horwood, 1986.
- Truss, J.K., Discrete Mathematics for Computer Scientists.

**16 Learning and Teaching Methods, including the nature and number of contact hours and the total study hours which will be expected of students, and how these relate to achievement of the intended learning outcomes**

Teaching methods will include weekly lectures and classes throughout the duration of the module. Lectures will provide opportunity for questions, discussion and simple problem solving. Classes will be informal in approach, providing opportunities for problem solving and discussion of topics and their applicability within CS. Web-based materials will supplement this. The use of these teaching methods will aid students in gaining an understanding of the mathematical principles behind topic areas within CS and to develop problem solving and formal reasoning skills.

Contact hours: 2 lectures and 1 class per week (1 hour class for those in possession of A-level mathematics, 2 hour class for those who are not).

Totals: 20 hours of lectures, 10/20 hours of classes, 100 hours self-directed study and examination revision.

**17 Assessment methods and how these relate to testing achievement of the intended learning outcomes**

Assessment will be 50% coursework and 50% unseen closed-book examination.

The examination and coursework will test the students' understanding of the course material across the learning outcomes for the module. The material tested by examination and coursework is the same.

Specific coursework assignments will be set to assess students' understanding of the material for the different topic areas within the module. An ability to undertake the assignments successfully indicates understanding of the topics and an ability to apply the knowledge.

**18 Implications for learning resources, including staff, library, IT and space**

Academic staff in the Computer Science department teach on this module. There will be no extra burden upon staff, library, IT or space than in its existing form.

**19 A statement confirming that, as far as can be reasonably anticipated, the curriculum, learning and teaching methods and forms of assessment do not present any non-justifiable disadvantage to students with disabilities**

The department recognises and has embedded the expectations of SENDA, and supports students with a declared disability or special (educational) need in its teaching, through the establishment of Inclusive Learning Plans agreed between student, department and the Disability Support Unit. We liaise with the Disability Support Unit in order to provide specialist support where needed.

**Statement by the Director of Learning and Teaching:** "I confirm I have been consulted on the above module proposal and have given advice on the correct procedures and required content of module proposals"

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Director of Learning and Teaching

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Date

**Statement by the Head of Department:** "I confirm that the Department has approved the introduction of the module and will be responsible for its resourcing"

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Head of Department

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Date