CS1005 Logic and Computation
Undergraduate Study Guide for 2015/16

Department of Computer Science

TABLE OF CONTENTS

MODULE DETAILS

Module Leader	Allan Tucker	
Department	Computer Science	
Credits	10	
Other staff	Stephen Swift Stasha Lauria	
Contact and private study time	Lectures	22 hours
	Labs/Seminars	22 hours
	General Study	156 hours
	Total	200 hours
Assessment	Method	[contribution to final grade]
	Coursework	25%
	Exam	75%

ACCESS TO SUPPORT MATERIAL AND ADDITIONAL INFORMATION

The majority of the teaching, learning and support material is provided electronically via the University's Blackboard Learn system. Note that the details provided in this study guide are based on the formal module syllabus for this module which sets out the agreed content, learning outcomes, assessment and teaching methods. Module syllabus and scheme of studies documents for your programme of study can be found by on the University's Quality Assurance web pages.

INTRODUCTION/AIMS/BACKGROUND

The aim of this module is to: introduce students to key novel computational paradigms starting with propositional and predicate calculus with logic programming using PROLOG and expanded through the use of models of uncertainty. This will be accompanied by techniques such as Turing Machines and more advanced computational approaches such as Artificial Intelligence models.

LEARNING OUTCOMES

Whatever module or programme of study you are studying for at Brunel University, there are learning outcomes (LO) that you must meet/achieve in order to be awarded the credits which comprise the module and programme of study. In order to get a pass grade (D- or above) in this module, you must meet these learning outcomes below, that is, you must demonstrate ability to:

LO1:   Demonstrate an applied understanding of logic programming
LO2:   Demonstrate an understanding of different approaches to reasoning
LO3:   Compare and contrast a variety of Artificial Intelligence paradigms
LO4:   Apply the basic principles of Turing machines and appreciate the inter-connectedness of compiler techniques.

METHOD OF TEACHING

Teaching methods will be based around lectures where new concepts will be explained and laboratories where these concepts will be further explored in a hands-on approach.

LECTURE SEMINAR PROGRAMME

This module has been scheduled to run during Term 1 and/or 2 and the lectures are scheduled as follows:

Term 1

Week	Lecture Topic	Lecturer
1	Introduction to Logic and Reasoning	Allan Tucker
2	History of Computing - Turing Machines	Allan Tucker
3	History of Computing - Regular Expressions	Allan Tucker
4	PROLOG	Stephen Swift
5	PROLOG	Stephen Swift
6	PROLOG	Stephen Swift
7	ASK WEEK	-
8	PROLOG	Stephen Swift
9	CW Introduction	Stephen Swift
10	History of Computing - Propositional Logic	Allan Tucker
11	History of Computing - Predicate Calculus	Allan Tucker
12	NO LECTURE	-

Term 2

Week	Lecture Topic	Lecturer
17	History of Computing - Boolean Logic	Allan Tucker
18	PROLOG VIVA	-
19	Sets, Sequences & Graphs	Allan Tucker
20	Probability & Distributions	Allan Tucker
21	ASK WEEK	-
22	Correlation and Linear Regression	Allan Tucker
23	Unsupervised Learning	Allan Tucker
24	Supervised Learning	Allan Tucker
25	Evaluating Models	Allan Tucker
26	NO LECTURE	-

Labs/Seminars are scheduled as follows:

Term 1

Week	Activity
1	NO LAB
2	Turing Machines
3	Finite State Machines
4	PROLOG
5	PROLOG
6	PROLOG
7	ASK WEEK
8	PROLOG
9	PROLOG
10	Propositional Logic
11	Predicate Calculus
12	-

Term 2

Week	Activity
17	Boolean Algebra
18	-
19	Sets, Sequences & Graphs
20	Probability & Distributions
21	ASK WEEK
22	Correlation and Linear Regression
23	Unsupervised Learning
24	Supervised Learning
25	Evaluating Models
26	NO LAB

Please note: Week 7 in Term 1 and week 21 in Term 2 are ASK weeks and there are no scheduled lectures, labs, or tutorials during these two weeks. Week 17 is the first week back after the Christmas break.

READING LIST
Core reading list:
N/A

Supplementary Reading:
• Epp, S.S. 1995/2004, Discrete mathematics with applications, 2nd or 3rd edn, PWS Publishing Company, Boston.
• Hand, D. 2001 Principles of Data Mining, MIT Press.

• Artificial Intelligence. A Modern Approach, S. Russel and P. Norvig, Prentice-Hall, 2003, ISBN 0 13 080302 2
• Programming in Prolog, W. Clocksin and C. Mellish, Programming In Prolog, Narosa Publishing, 2001. ISBN 8185198152

Other Sources:
• Caswell, F. 1995, Success in Statistics, 3rd edition, John Murray: London.
• Gonick, L. and Smith, W. 1993, The cartoon guide to statistics. Harper Resource, New York, NY.
• Rowntree, D, Statistics without tears: Penguin Mathematics, 2000.
• Ross, K.A. and Wright, C.R. Discrete Mathematics, 5th Revised edition: Prentice-Hall, 2002.
• Bancroft G. & Fletcher, M. 2000, Improve Your Maths, Addison Wesley, Harlow.
• Schneider, G.M. & Gersting, J.L. 2004, An Invitation to Computer Science: Java Version, 2nd ed., Brooks/Cole, Thomson Learning, Pacific Grove, CA.
• Silver, M.S. 1997, Business statistics, 2nd edition, McGraw-Hill, London.
• Spatz, C. Basic Statistics: Tales of Distributions, 9th edition: Thomson Advantage Books, 2007.

Please note that there is a wealth of material, much of it freely available on the web or in the library. The above are suggestions but you are encouraged to search for and make use of other sources.

It is important that you learn to become self-reliant and able to access and assimilate material for yourself. Many of the topics necessary for this project will not be covered by lectures. Therefore you will need to work through the exercises and guidance material provided in labs, via Blackboard or from your own investigations.

ASSESSMENT

The module is assessed with 25% coursework and 75% written exam. Coursework will consist of a PROLOG programming assignment (25%). This will involve a viva whereby you will demonstrate and explain your code to a member of staff.

How the assessment relates to the learning outcomes:
PROLOG assignment (LO1).
Exam (LO1, LO2, LO3, LO4)

DELIVERABLES AND FEEDBACK - IMPORTANT DATES

You should prepare and submit all coursework according to the Department's instructions for assessments which are available on Blackboard Learn. You should make sure that you are fully aware of the Department's policy on plagiarism and the marking of joint work. You should also be aware that you *cannot* later claim that you did not know the rules and regulations as you must make yourself familiar with them. If you cannot complete any work on time, you should look at the Department's instructions on what to do. The Department policy is that all coursework must be submitted electronically via the University's Blackboard system. Please navigate to the Blackboard Learn pages for this module for further details. You will get feedback on your performance via the Blackboard Learn pages for this module. If do not receive your feedback by the given date, you should first contact the module leader. If it proves necessary, you should also contact your Level Co-ordinator.

The important dates:
In the table below, the key dates and tasks associated with the assessment for the module are set out.

Task	Assignment Title	Available on Blackboard	Submission deadline	Feedback due	Weighting (%)
T1	PROLOG programming assignment	26th October 2015	17th January 2016	12th February 2016	25%
T2	PROLOG programming viva	NA	22nd January 2016	12th February 2016	PASS/FAIL

Note: the deadline date ends at @ 23:59GMT (e.g., if the deadline is 1 February, it means the deadline is up to 23:59GMT on 1 February)

ADDITIONAL VITAL INFORMATION

The College Student Handbook can be found on the College's SharePoint site on the University's web pages. The handbook is a useful source of information for all aspects of your studies, including procedures of how to inform us of problems you are facing with your studies, how to apply for an extension to your coursework, plagiarism, house style for assignments, joint and group work submissions and other important matters. The Department assumes that you familiarise yourself with this information, so you will need to look at these pages carefully at various times throughout your studies. The Department also operates within the rules and regulations of the University more generally, and you should also look at what are known as 'Senate Regulations' under the University's web pages. These policies and procedures might change from one academic year to another and it is in your own interest to keep yourself aware about them and their possible changes.