COMP340-08B

Reasoning about Programs

— Course Outline —

This paper introduces predicate logic as it is used in various areas of software development and artificial intelligence, as well as Hoare logic and its use for program verification. Methods of reasoning in logic and automated theorem proving are discussed. The paper includes a laboratory-based component in which students learn to apply the concepts of program verification using a current verification tool.

After passing this paper, students will be able to express properties of programs in propositional and predicate logic, and to reason in logic. They will be able to verify sequential programs using a program verification tool.

Lecturers

Dr. Robi Malik. Room G 2.23, phone (07) 838 4796, `robi@cs.waikato.ac.nz`
Dr. Tim Stokes. Room G 3.11, phone (07) 838 4131, `stokes@math.waikato.ac.nz`

Paper Web Site (Moodle)

`http://elearn.waikato.ac.nz/course/view.php?id=2567`

Timetable

Lecture	Tuesday	15:00 – 16:00	G 3.33
Lecture	Wednesday	12:00 – 13:00	G B.13
Lecture	Thursday	13:00 – 14:00	G 3.33
Tutorial	Friday	9:00 – 10:00	K G.06 or R G.19

Prerequisite Papers

(**COMP 140** Foundations of Computer Science **or**
COMP 235 Logic and Computation) **and**
(**COMP 103** Introduction to Computer Science I **or**
COMP 153 Practical Programming)

Restricted Papers

COMP 240 Mathematical Foundations of Computer Science

Highly Recommended Text

Michael Huth, Mark Ryan, Logic in Computer Science, 2nd edition, Cambridge University Press, 2004.

Computing Resources

The Linux computers in Computing Laboratory 7 (R G.19) will be used for tutorials and assignments.

Teaching Strategy

The lectures will introduce, using references to text books and via lecture notes, new ideas and theory that form the basis for the topic covered. Where appropriate, there will also be practical work which aims to make you think about the material you have met in the lectures and so guide you towards your own understanding. Where practical work is not used, you will need to follow a more traditional line and read and do exercises in order to develop your understanding.

Attendance Policy

Lecture attendance is expected. The course notes provided and the text book references are not necessarily comprehensive and it is very likely that additional material will be covered in lectures. You are responsible for all material covered in lectures.

Expected Workload

This is just a rough guideline, but on average we would expect you to spend 10 hours on reading, thinking, and doing your assignments in addition to attending the lectures and tutorials. That makes about 14 hours a week. Furthermore, you should expect to spend 30 hours in preparation of the final exam.

Means of Assessment

The internal assessment consists of 11 assignments to be carried out individually. They will be handed out in the Thursday lectures, and will be due in on Wednesday 17:00 the following week. Assignments 1–5 and 7–11 are each worth 1/12 of the internal assessment, whereas assignment 6 is weighted double at 2/12 of the internal assessment. In addition, all students have to sit the final exam and achieve at least 40% in it.

Internal Assessment / Final Examination Ratio: 1:1

Official Policies

Your attention is drawn to the following policies and regulations, which are contained in the University Calendar:
- Assessment Regulations
- Policy on the Use of Maori for Assessment
- Student Complaints Policy
- Student Discipline Regulations
- Student Research Regulations
- Human Research Ethics Regulations
- Discipline Regulations. This applies to any misconduct, including cheating, misuse of computer facilities, or other breach of the University regulations.
- Computer System Regulations

Your attention is also drawn to the following policies and regulations which are contained in the 2008 SCMS Undergraduate Handbook:
- Conditions of Use of SCMS Computer Systems