

PROPOSAL TO INTRODUCE A NEW COURSE

1. COURSE DETAILS

1.1 **CourseID** COMP 9153

1.2 **Course name – Long** Algorithmic Verification

1.3 **Course name – Abbreviated** Algorithmic Verification

1.4 **Course Authority** **ext/email**
Ansgar Fehnker ansgar@cse.unsw.edu.au

1.5 **Organisational Unit responsible for course**

School: School of Computer Science Engineering **Faculty:** Engineering

1.6 Justification of Proposal

The course COMP 4151 "Advanced Topic in Concurrency" was proposed in 2003 as a generic template for a variety of advanced courses in the theory of concurrent and distributed systems for fourth year and postgraduate research students. In practice, it has been instantiated by two different courses. In 2003 S1 and 2005 S1 the course was given by Rob van Glabbeek under the title "Comparative Concurrency Semantics" and in 2004 S1 and 2006 S1 it was given by Ron van der Meyden, Ralf Huuck and Ansgar Fehnker under the title "Algorithmic Verification".

As it currently looks as if both courses are being continued indefinitely, it appears prudent to give them different course numbers:

- COMP 3152/9152 Comparative Concurrency Semantics
- COMP 3153/9153 Algorithmic Verification

Amongst others, this enables students to enrol in both courses, which is proper given that they have different content. It also enables us to offer both courses in the same session. Given the fact that the material in both courses is particularly suited for 3th year students, at the same time we propose to emphasise this by picking course numbers starting with a 3. As the course is also useful for graduate students, we'd like to also offer it as 9xxx.

1.7 Consultation Process

The Formal Methods group in NICTA wants to increase the visibility and continuity of their teaching. Splitting the single course with alternating titles into two courses would serve both purposes. The CSE teaching committee was consulted, and helped formulate the current proposal.

1.8 **Units of credit** **Session/soffered** **Hours Per Week**
6UC S1 3 hours

1.9 **Pre-requisites:** COMP9024 or enrolment in 8684 program
Co-requisites: none

Exclusions: none

1.10 Proposed Entry in the Faculty Handbook

It is virtually impossible to guarantee correctness of a system, and in turn the absence of bugs by standard software engineering practice such as code review, systematic testing and good software design alone. The formal methods community has developed various rigorous, mathematically sound techniques and tools that allow the automatic analysis of systems and software. The application of these fully automatic techniques is typically called algorithmic verification.

The course will describe several automatic verification techniques, the algorithms they are based on, and the tools that support them. We will discuss examples to which the techniques have been applied, and provide experience with the use of several tools.

1.11 Is this course replacing an existing course?

YES COMP 4151. See "rationale" earlier in this proposal.

1.12 Postgraduate

1.13 Elective

1.14 Program stage

Stage 2 in coursework programs that require more than one year

Stage 1 in programs that require at most one year.

1.15 Program/s in which course is available

8682 MCompIT

8684 MIT

5432 Graduate Diploma in Computing & Information Technology

7344 Graduate Certificate in Advanced Computing

1650 PhD

2665 ME

2765 MSc

1.16 Proposed teaching methods and assessment practices

Teaching: lectures, tutorials

Assessment: homework assignments, projects, exams

2 Assignments, together: 25%, Verification Project: 25%, Final Exam: 50% (2h, written)

1.17 Assessment grades to be used

Full range of UNSW grades (i.e. FL,PS,CR,DN.,HD,etc.)

1.18 Mode of delivery

Internal x

External

Other (specify)

1.18.1 Multi-mode Delivery Guidelines N/A

1.19 Information Technology Requirements for students

The standard computing resources available in CSE are adequate.

1.20 Textbooks

Logic in Computer Science, Huth and Ryan, Cambridge University Press.

Model Checking, Edmund Clarke, Orna Grumberg and Doron Peled, MIT Press.

1.21 Industrial experience component

None

1.22 Parallel Teaching Requirement

This course may be taught concurrently with COMP3153 Algorithmic Verification. It is an elective course in the MCompIT, MIT and associated graduate certificates and diplomas, and may be taken by research students as part of their coursework requirement.

Both COMP9153 and COMP3153 are taught concurrently under Recommendation 3 of the Academic Board Policy on Parallel Teaching (Resolution AB04/106).

Lectures and some assessment tasks are delivered concurrently.

- a) The handbook course description contains a statement that advises students that parallel teaching of postgraduate and undergraduate course is occurring.
- b) Postgraduate students are enrolled under a postgraduate course code.
- c) Postgraduate students are required to complete an additional assignment.
- d) Postgraduate students and undergraduate students take different final examinations.

2. RESOURCE STATEMENT

2.1 Enrolments

Estimated or proposed enrolments for the next three years.

2005: 15

2006: 25

2007: 35

2.2 Resource Requirements

Staffing Requirements:

Hours per week

3 Full-time Academic Staff

1 Part-time Teaching Staff

0 General Staff

Field Costs: N/A

Studio/Laboratory Requirements: N/A

Materials Requirements: N/A

Equipment Costs: N/A

Computing Requirements: Already covered by CSE infrastructure

Library Requirements: Standard for a course of this size

Capital Funds Requirements: None

2.3 Servicing Implications: None

2.4 Teaching Arrangements:

) Will other units contribute on a regular basis to the teaching of this course? No

2.5 Alternative Delivery Arrangements: N/A

2.6 Details of Tuition Fees:

Standard fee scale as for other CSE postgraduate courses.

3. AUTHORISATION

3.1 University Librarian's Endorsement

Note: this section of the Proposal must be signed by a Library representative, stating:

I have examined the Library needs related to the above proposal and certify that existing Library holdings, staffing, services and accommodation are adequate / inadequate (delete one) to cover the demands that are inherent in it.

Appropriate arrangements for the use of digitised material to support this course have been made by the Course Authority with the University Librarian.

Further Comments:

University Librarian
/ /2005

3.2 Head of School's Approval

Note: this section of the Proposal must be signed by the Head of School, stating:

I have examined the resource implications of the above proposal in regard to staff, space, materials, equipment, capital funds, and computing, and certify that the School can cover the demands that are inherent in it.

Further Comments:

Head of School
/ /2005

3.3 Dean's Approval

Note: this section of the Proposal must be signed by the Dean, stating:

I have examined the resource implications of the above proposal in regard to staff, space, materials, equipment, capital funds, and computing, and certify that:

(Tick whichever is applicable)

3.3.1 (i) the proposal involves no additional resources. (A statement from the Head of School explaining how this can be achieved must be provided); or

- (ii) the proposal involves additional resources and it is proposed to redeploy existing resources within the faculty. (A statement from the Head of School explaining how this will be achieved must be provided); or
- (iii) the proposal involves additional resources to be obtained as set out below; or
- (iv) the additional resources essential to bring the proposal into effect cannot be found within resources available to the faculty.

3.3.2 **Fees**(delete if not applicable):

- a fee will not be charged for this program (other than HECS)
- a fee will be charged for this program for local fee-paying students
- a fee will be charged for international students

If a fee is to be charged the Dean certifies as follows:

I have ensured that the Vice-Chancellor has been advised of the proposed fee arrangements, and note that approval of fee arrangements is needed before the new program can be implemented.

3.3.3 the proposal conforms to the University's commitment to Equal Opportunity in Education.

Statement from Head of School on Source of Additional Resources and/or Further Comments:
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Dean
/ /2005