

PROPOSAL TO INTRODUCE A NEW COURSE

(formerly known as subject)

1. COURSE DETAILS

1.1 Course ID COMP4xxx

1.2 Course name - Long

Analysis of Algorithms

1.3 Course name - Abbreviated

Analysis of Algorithms

1.4 Course Authority

Toby Walsh

ext/email

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1.5 Organisational Unit responsible for course

School: Computer Science and Engineering

Faculty: Engineering

Academic Group Code (Faculty): ENG

Academic Organisation Code (Owner): COMPSC

1.6 Justification of Proposal

This proposed course is intended to provide students with skills necessary to study and analyse computational problems, including complexity and optimisation analysis. Emphasis will be on teaching problem solving skills as opposed to mathematical theory and students will be exposed to some computer tools like Maple and MATLAB to help them do such problem solving. The course will present material which is not covered in MATH1081, COMP3121/3821/9101 and COMP4121.

The necessary background materials from these courses will be briefly covered before moving on to the course goals of teaching students how to solve such problems in practice.

1.7 Consultation Process

Consultation has been undertaken with members of the teaching Committee of the School of Computer Science and Engineering, representatives of the School of Mathematics, and students, industry representatives and other academics via the Computer Science Co-op Steering Committee.

1.8 Units of credit (UOC)

6

Session/s offered

S1

Hours Per Week

5

1.9 Pre-requisites: COMP3121/3821, WAM of 65 or above

Co-requisites: NIL

Exclusions: MATH2140

1.10 Proposed Entry in the Faculty Handbook

Topics will be drawn from the following list. Complexity. Problems like SAT, Hamiltonian circuit, and number partitioning. Proving NP-completeness: restriction; local replacement; gadget design. Dealing with NP-completeness. Approximation problems. Performance guarantees. Beyond NP. Linear programming. Simplex algorithm. Interior-point methods. Integer programming. Constraint programming.

1.11 Is this course replacing an existing course?

YES

NO X

1.12 Undergraduate / ~~Postgraduate~~ / ~~Other~~ (delete what is not applicable)

1.13 ~~Core~~ / Elective (delete one)

1.14 Program stage

Taken in Stage III (first offered in S1 2006)

1.15 Program/s in which course is available

BSc Computer Science (COMP3978)

BE Bioinformatics (BINF3647)

BE Computer Engineering (COMP3645)

BE Software Engineering (SENG3648)

Combined programs of which the above form a part

1.16 Proposed teaching methods and assessment practices

Teaching will include both lecture and tutorial / laboratory sessions. Assessment will include formal examination and assignments.

1.17 Assessment grades to be used

The full range of grades will be used for assessment.

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

Existing hardware and software site licenses will be used.

1.20 Textbooks

No text book will be required, but recommended reading will include:

Concrete Mathematics, by Ronald L. Graham, Donald E. Knuth, and Oren Patashnik (Reading, Massachusetts: Addison-Wesley, 1994), xiii+657pp. ISBN 0-201-55802-5

M. R. Garey and D. S. Johnson, Computers and Intractability./New York: Freeman/, 1979. ISBN: 0716710455

Linear Programming Foundations and Extensions Springer Series: International Series in Operations Research and Management Science <<http://www.springeronline.com/sgw/cda/frontpage/0,11855,5-10051-69-33108794-0,00.html>>, Vol. 37 Vanderbei, Robert J. 2nd ed., 2001, 472 p., Hardcover ISBN: 0-7923-7342-1

1.21 Industrial experience component

N/A

2. RESOURCE STATEMENT

2.1 Enrolments

Estimated or proposed enrolments for the next three years.

2006: 10

2007: 13

2008: 15

2.2 Resource Requirements

Staffing Requirements:

Hours per week

Full-time Academic Staff 3 hours of lectures and 2 hours of tutorial / practical classes, given the course enrolment remains small

Part-time Teaching Staff NIL

General Staff NIL

Field Costs: NIL

Studio/Laboratory Requirements: NIL

Materials Requirements: NIL

Equipment Costs: Maple classroom (teaching) licence — $\$130 / \text{user} \times 10 = \1300 (using the School of Mathematics licence and dependent on them being able to partition their licence server)

Matlab classroom licence — $\$1452 + \$329 / \text{year for maintenance} = \1781

Computing Requirements: NIL — to use existing computer laboratory equipment

Library Requirements: See reading list (1.20 above)

Capital Funds Requirements: NIL

2.3 Servicing Implications:

N/A

2.4 Teaching Arrangements:

YES X

NO

Guest speakers from National ICT Australia will present sessions on an as-required basis.

2.5 Alternative Delivery Arrangements:

N/A

2.6 Details of Tuition Fees:

Proposed fee: Standard for Faculty of Engineering

3. AUTHORISATION

3.1 University Librarian's Endorsement

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

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

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

- 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:

Dean
/ /2005

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