PROPOSAL TO REVISE A COURSE

(formerly known as subject)

1. COURSE DETAILS

1.1 Course ID COMP9417

1.2 Course name - Long
Machine Learning and Data Mining

1.3 Course name - Abbreviated
Machine Learning and Data Mining

1.4 Course Authority **ext/email**
Mike Bain **56935/mike@cse.unsw.edu.au**

1.5 Organisational Unit responsible for course
School/Department: **AOU Code:**

School: Computer Science and Engineering **Faculty: Engineering**

Academic Group Code (Faculty): ENG
Academic Organisation Code (Owner): COMPSC

1.6 Revision of Course Summary Checklist

to change the course name or number:
CURRENT COURSE ID/NAME COMP9417/Machine Learning
NEW COURSE ID/NAME COMP9417/Machine Learning and Data Mining

X to amend the Handbook description

X to vary the pre-requisites or co-requisites

to vary the contact hours

to vary the unit of credit value

to offer the course by alternative means eg. distance education.

Other (specify)

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1.7 Justification of Proposal

The proposed revisions will update the machine learning course which has remained unchanged since its introduction ten years ago. Additionally they will also serve to simultaneously link this course with and differentiate it from the proposed new course COMP9318 Data Warehousing and Data Mining. There is a pressing need for this update since the field has developed rapidly in the last ten to fifteen years. Many new techniques have supplanted those specified in the handbook entry, often derived from developments in the theory of machine learning. A much wider community than in the past is now applying these techniques to problems in science, health, commerce, industry and government. The change of name is required to reflect the fact that

machine learning provides the computational basis of data mining. Other areas, notably statistics and databases, have adopted the term data mining. The revised course contains material from both statistics and databases but is differentiated from these areas in important ways. Statistics is primarily focused on a parametric approach where ultimately the user of data mining software is expected to be statistically trained. In databases the focus is on technology for handling large databases and data warehouses, although most algorithms come from machine learning or statistics, as does the experimental methodology. The revised course will continue to be a high quality scientific course on machine learning, providing students with a sound basis for research, development and applications in the field.

1.8 Consultation Process

The Head of School, AI and Database groups.

1.9	**Units of credits**	**Session/s offered**	**Hours Per Week**
	6	2	3

1.10 Pre-requisites: COMP9041
Co-requisites: N/A
Exclusions: N/A

1.11 Current Entry in the Faculty Handbook, with Proposed Revision Clearly Indicated or Proposed Entry in the Faculty Handbook

Machine learning is the algorithmic approach to learning from data. This course covers the key techniques in data mining technology, gives their theoretical background and shows their application. Topics include: decision tree algorithms (such as C4.5), regression and model tree algorithms, neural network learning, rule learning (such as association rules), lazy learning, version spaces, evaluating the performance of machine learning algorithms, Bayesian learning and model selection, algorithm-independent learning, ensemble learning, kernel methods, unsupervised learning (such as clustering) and inductive logic programming (relational learning).

1.12 Is this course replacing an existing course?

YES x COMP9417 Machine Learning

NO

1.13 Undergraduate / Postgraduate

1.14 Elective

1.15 Program stage
(Undergraduates) Usually taken in Stage III (first offered in S1, 2005)

1.16 Program/s in which course is be available
BE (CE 3645; SE 3648; BioInf 3647), BSc (CS 3978), plus combined degrees involving any of these, and the following postgraduate programs: MEngSc 8685; McompSc 8680; MInfSc 8508; MSc 2665; ME 2765; PhD 1650;

1.17 Proposed teaching methods and assessment practices
Examinable (formal) and assignments

1.18 Assessment grades to be used

Full range of grades (HD, DN, CR, PS, FL)

1.19 Mode of delivery

Internal x

External

Other (specify)

1.20 Information Technology Requirements for students

Standard for Computer Science and Engineering

1.21 Textbooks

Set textbooks: Machine Learning, Tom Mitchell, (1997), McGraw-Hill
Recommended References:

- Data Mining, Ian Witten and Eibe Frank, (2000), Morgan Kaufmann
- Pattern Classification (2nd ed.), Duda, Hart and Stork, (2001), Wiley
- Elements of Statistical Learning, Hastie, Tibshirani and Friedman, (2001), Springer
- Pattern Recognition and Neural Networks, Brian Ripley, (1996), Cambridge
- Classification and Regression Trees, Breiman, Friedman, Olshen and Stone (1984), Kluwer
- C4:5: programs for Machine Learning, J. R. Quinlan (1993), Morgan Kaufmann
- Selected papers from the conference proceedings of ICML, SIGKDD, IJCAI, COLT, NIPS, ILP, ECML, etc.

1.22 Industrial experience component

N/A

2. RESOURCE STATEMENT

2.1 Enrolments

Estimated or proposed enrolments for the next three years.

2003: 40

2004: 50

2005: 70

2.2 Additional Resource Requirements Resulting from Revision

Staffing Requirements:

Hours per week

Full-time Academic Staff: 5 hours/week (one semester only)
Part-time Teaching Staff: 6 hours/week.
General Staff: Covered by standard support of the Computer Support Group

Field Costs: N/A

Studio/Laboratory Requirements: N/A

Requirements:

Materials Requirements: N/A

Equipment Costs: N/A

Computing Requirements: Use of existing facilities in the school

Library Requirements: Standard textbooks for reference, journal articles and conference proceedings

Capital funds Requirements: N/A

2.3 Servicing Implications:
N/A

2.4 Teaching Arrangements:

YES

NO x

2.5 Alternative Delivery Arrangements:
N/A

2.6 Multi-mode Delivery Guidelines
The following issues should be addressed in proposals for Multi-mode delivery:

- parity in admission requirements to ensure that the integrity of programs at UNSW was not compromised;
- administrative processes relating to enrolments and dealing with students overseas;
- content and standard of courses and assuring comparability with on-campus courses;
- by whom and how courses were to be delivered;
- assessment procedures; and
- availability of library resources.

Note: The business components of off-shore proposals are considered by the International Strategies Committee (ISC) chaired by Professor Wainwright, Deputy Vice-Chancellor (Research) whilst the Academic Board approves the academic aspects of proposals for offshore delivery of existing programs. The ISC considers (i) partnership arrangements; (ii) whether the impact on the faculty of staff going overseas has been considered; and (iii) whether appropriate steps have been taken to register the program in the country concerned.

The Postgraduate Coursework Committee has wished to ensure that the following issues have been addressed in proposals for offshore delivery: parity in admission requirements to ensure that the integrity of programs at UNSW is not compromised; administrative processes relating to enrolments and dealing with students overseas; content and standard of courses and assuring comparability with on-campus courses; by whom and how courses are to be delivered; assessment procedures and availability of library resources.

Proponents should contact the Office of the Deputy Vice-Chancellor (Research and International) regarding this committee.

2.7 Details of Tuition Fees:

Proposed fee:

$ for non-award enrolment (local)

$ for non-award enrolment (international)

$ for course which forms part of full fee-paying course (local)

$ for course which forms part of full fee-paying course (international)

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
/ /2004

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
/ /2004

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.

3.2.2 **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
/ /2004

Please refer to the following link for
DISABILITY GUIDELINES FOR ACADEMIC STAFF PREPARING COURSES