PROPOSAL TO REVISE A COURSE

(formerly known as subject)

1. COURSE DETAILS

1.1 Course ID

COMP9519

1.2 Course name - Long

Multimedia Systems

1.3 Course name - Abbreviated

Multimedia Systems

1.4 Course Authority	ext/email
Zhenghua (Jack) Yu (Co-ordinator)	8374 5571/zyu@cse.unsw.edu.au
Jian Zhang	8374 5556/jzhang@cse.unsw.edu.au
Reji Mathew	8374 5562/rmathew@cse.unsw.edu.au

1.5 Organisational Unit responsible for course

School: School of Computer Science and Engineering
Faculty: Engineering
Academic Group Code (Faculty): ENG
Academic Org anisation Code (Owner): COMPSC

1.6 Revision of Course Summary Checklist

X to change the course name or number:
CURRENT COURSE ID/NAME COMP9519 Multimedia Authoring and Cooperative Agents
NEW COURSE ID/NAME COMP9519 Multimedia Systems

X	to amend the Handbook description	X	to vary the pre-requisites or co-requisites
No	to vary the contact hours	No	to vary the unit of credit value
No	to offer the course by alternative means eg. distance education.	No	Other (specify)

When using digitised material, consult with the University Librarian on 9385-2662 to make appropriate arrangements regarding COPYRIGHT LAW.

1.7 Justification of Proposal

It has been more than four years since COMP9519 (also known as Multimedia Systems) was introduced. The field of multimedia technology has developed rapidly in the past few years. Multimedia compression, streaming and presentation technologies have matured, whilst multimedia annotation, archiving and retrieval technologies have made important progress. We have seen wide-spread applications of multimedia technology, from entertainment, information, education, to tele-medicine, to name just a few. It is time to update the content in order to modernise the course. The revised course addresses the key principles, techniques and applications of multimedia systems. Students will benefit from understanding multimedia technology and developing in depth and practical skills. Meanwhile, although known as "Multimedia Systems" before, formally changing the name of the course is needed to reflect the major topics covered in this course.

1.8 Consultation Process

No other academic unit is relevant to this course. Student feedback suggests that a revised course on multimedia systems would be most welcome.

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

6	S2	4

1.10 **Pre-requisites**: COMP2011 or COMP2711 or COMP9024. Must have completed at least 12 UOC of level 3 or above courses.
Co-requisites: No.
Exclusions: No.

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

Multimedia systems covers the key principles, techniques and applications of multimedia technology. Topics include: multimedia funda mentals; audio, image and video compression; multimedia streaming; multimedia presentation; multimedia content description; video structure analysis; video summarization and representation; multimedia database indexing, browsing, search and retrieval; multimedia systems and applications.

1.12 **Is this course replacing an existing course?**

YES COMP9519 Multimedia Authoring and Cooperative Agents

1.13 **Undergraduate / Postgraduate**

1.14 **Elective**

1.15 **Program stage**
Usually stage 4 in undergraduate and stage 2 in postgraduate.

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: MCompIT 8682; MIT 8684; GradDipCompIT 5432; GradCert IT 7344; 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

1.20 **Information Technology Requirements for students**
Standard for Computer Science and Engineering

1.21 **Textbooks**
Set textbooks: none
Recommended References:
* Ghanbari M, Video coding: an introduction to standard codecs, IEE Publishing, 1999.
* Haskell B G, Puri A and Netravali A N, Digital video: an introduction to MPEG-2, Kluwer Academic Publishers, 1996.
* Shi Y Q, Image and video compression for multimedia engineering, CRC Press, 2000.
* Manjunath B S, Salembier P, Sikora T (ed), Introduction to MPEG-7, Multimedia Content Description Interface, John Wiley & Sons, Ltd, 2002.
* Feng D, Siu W C and Zhang H J (ed), Multimedia Information Retrieval and Management, Springer, 2003.
International Standards:
* RTSP www.ietf.org/rfc/rfc2326.txt

* SDP www.ietf.org/rfc/rfc2327.txt
* RTP www.ietf.org/rfc/rfc1889.txt
* RTP for MPEG-4 www.ietf.org/rfc/rfc3016.txt
* XML www.w3.org/TR/REC-xml/
* SMIL www.w3.org/TR/smil20/

Proposed syllabus:

Week	Description
[1] Introduction	▪ Introduction to multimedia computing and its challenges ▪ Current major research directions and topics ▪ The course scope & arrangement ▪ Basic concepts in multimedia signal processing
[2] Introduction to audio, video and image coding techniques (I) -- Fundamentals	▪ Audio, image & video formats ▪ The need for digital compression ▪ Spatial redundancy in images ▪ Lossless & predictive coding (entropy coding) ▪ Quantization & transform coding ▪ Still Image Coding Standard JPEG
[3] Introduction to audio, video and image coding techniques (II) -- Coding Techniques	▪ Subband coding ▪ Introduction to audio coding ▪ Temporal redundancy & temporal predictive coding for video ▪ Motion estimation & compensation ▪ Human visual system characteristics
[4] Video compression standards (part I)	▪ Digital video coding standards MPEG I/2 video i. MPEG-I/2 introduction & codec architecture ii. MPEG-2 profiles and levels iii. MEPG-2 scalable coding iv. MEPG-2 error resilience/error concealment v. MPEG-2 applications
[5] Video compression standards (part 2)	▪ Introduction to MPEG-4 video standard: content based video coding ▪ Introduction to ITU-T video standards H.261/H.263/H.264 ▪ Introduction to MPEG system: Video , Audio and Data Multiplexing
[6] Internet Streaming Media	▪ Internet streaming media architecture ▪ Client / Server Architecture ▪ Real Time Streaming Protocol – "internet VCR controls" ▪ Issues of real-time delivery – delay, packet loss, error resilience, QoS ▪ Real-time data transport ▪ Real-time Transport Protocol (RTP) ▪ Control protocol / QoS Feedback (RTCP) ▪ Inter-media synchronization ▪ Example - RTP Payload format for MPEG-4
[7] Multimedia Presentation	▪ File Formats ▪ Multimedia File Formats – requirements and features ▪ Examples MP3, MP4 ▪ Introduction to XML ▪ Synchronized presentation ▪ Moving from static to dynamic presentation - Introduction to SMIL ▪ Timing, Sequencing, Lay Out of multimedia objects ▪ User interaction
[8] Multimedia Content Description (part I)	▪ Need for meta data to describe content ▪ Goals of MPEG-7 - Multimedia Content Description Interface ▪ MPEG-7 description schemes for Content Management ▪ information on creation and production of media content; ▪ description of compression, profile, storage format of content
[9] Multimedia Content Description (part 2)	▪ MPEG-7 description schemes for Content Description ▪ Images: descriptors and feature extraction for colour, shape, texture

	▪ Video : descriptors and feature extraction for motion ▪ Content Search examples based on Image/Video features
[10] Fundamentals of content based image and video retrieval	▪ content based retrieval system introduction ▪ query specification ▪ brief review of descriptors (linkage to annotation) ▪ similarity measures (distances) ▪ brief introduction of retrieval concept ▪ performance evaluation (precision and recall)
[11] Video structure analysis	▪ shot boundary detection ▪ key frame extraction ▪ shot similarity ▪ shot clustering ▪ scene grouping ▪ story segmentation
[12] Video representation and summarization	▪ video content representation: sequence/scene/shot/key-frame based; key frame based; shot based (temporal slice; object; perceived motion) ▪ video summarization ▪ video highlighting ▪ video skimming
[13] Multimedia content retrieval	▪ video indexing; dimension reduction (PCA; KLT); indexing schemes (tree) ▪ browsing schemes (time-line, light-table; hierarchical; graph based story-board) ▪ search and retrieval ▪ relevance feedback
[14] Multimedia systems and applications	▪ wireless multimedia applications ▪ digital library ▪ broadcasting

1.22 Industrial experience component

No.

2. RESOURCE STATEMENT

2.1 Enrolments

Estimated or proposed enrolments for the next three years.

2005: 40

2006: 50

2007: 60

2.2 Additional Resource Requirements Resulting from Revision

Staffing Requirements:

Hours per week

Full-time Academic Staff: 5

Part-time Teaching Staff: 1 hour per 20 students

General Staff: Covered by standard support of the Computer Support Group

Lectures will be given by NICTA conjoint staff.

Field Costs:	Nil
Studio/Laboratory Requirements:	Nil
Materials Requirements:	Nil
Equipment Costs:	Nil
Computing Requirements:	Use of existing facilities in the school
Library Requirements:	Standard textbooks for reference, journal articles and conference proceedings
Capital funds Requirements:	Nil

2.3 Servicing Implications:
N/A

2.4 Teaching Arrangements:

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 tak en 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: Standard fees for Faculty of Engineering

$ 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