S.96-2

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate

From: D. Gagan, Chair
Senate Committee on
Academic Planning

Subject: Curriculum Revisions
Faculty of Applied Sciences

Date: December 11, 1995

Action undertaken by the Senate Committee on Undergraduate Studies and the Senate Committee on Academic Planning gives rise to the following motion:

Motion:

"that Senate approve and recommend approval to the Board of Governors the curriculum revisions for the Faculty of Applied Sciences as set forth in S.96-2 as follows:

S.96-2a School of Engineering Science

For Information:
Acting under delegated authority of Senate, SCUS approved revisions in

S.96-2b School of Communication
S.96-2c School of Computing Science
S.96-2d School of Kinesiology

Agreement has been reached between the Faculty and Library in the assessment of library costs associated with the new course.

School of Engineering Science

SCUS Reference: SCUS 95 - 21 b
SCAP Reference: SCAP 95 - 65 c

New course: ENSC 474-4 Multimedia Communications Engineering

Changes to the wording of admission criteria

For Information:
Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 95 - 21 b:

Renumbering of: ENSC 103-1 to ENSC 204-1
ENSC 104-1 to ENSC 203-1
ENSC 105-1 to ENSC 305-1
ENSC 106-1 to ENSC 306-1
ENSC 107-1 to ENSC 407-1
ENSC 108-0 to ENSC 408-0

SIMON FRASER UNIVERSITY
NEW COURSE PROPOSAL

Calendar Information
Course Number (e.g. CHEM150): ENSC 474

Course Title: MULTIMEDIA COMMUNICATIONS ENGINEERING

Credit Hours: 4 Vector: 3-0-2

Course Description (for Calendar). Attach a course outline to this proposal.

See Attached

Prerequisite: ENSC 281

Corequisite:

Special Instructions:

Course(s) to be dropped if this course is approved: None

Rationale for Introduction of this Course: Will this be a required or elective course in the curriculum; probable enrolment when offered?

Multimedia communications is an important and growing technological area and students need a solid technical understanding of the field. We would expect approx. 10 students per year to be enrolled in this optional course.

Scheduling and Registration Information
Indicate Semester and Year this course would be first offered and planned frequency of offering thereafter.

It will be offered once per year, starting in 96-3.

Which of your present CFL faculty have the expertise to offer this course? Will the course be taught by sessional or limited term instructors?

Bird, Cuperman and Vaisey can all teach this course.

Are there any proposed student fees associated with this course other than tuition fees? NO

Is this course considered a 'duplicate' of any current or prior course under the University's duplicate course policy? Specify, as appropriate. NO

Approvals

Albert M Leung
Chair, Department/School
Nov 28, 95
Date

Pamela Bawa
Chair, Faculty Curriculum Committee
Nov. 28, 1995
Date

Chair, SCUS
6/12/95
Date

SIMON FRASER UNIVERSITY
NEW COURSE PROPOSAL - RESOURCES

Course Number (e.g. CHEM 150): ENSC 474

Resource Implications:
Note: Senate has approved (S.93-11) that no new course should be approved by Senate until funding has been committed for necessary library materials. Each new course proposal must be accompanied by a library report and, if appropriate, confirmation that funding arrangements have been addressed.

Provide details on how existing instructional resources will be redistributed to accommodate this new course. For instance, will another course be eliminated or will the frequency of offering of other courses be reduced; are there changes in pedagogical style or class sizes that allow for this additional course offering.

This course will be an elective. Including it in our list of courses will mean that other electives will not be offered quite as frequently.

Does this course require specialized space or equipment not readily available in the department or university, and if so, how will these resources be provided?

No, specialized equipment will not be required.

Does this course require computing resources (e.g. hardware, software, network wiring, use of computer laboratory space) and if so, describe how they will be provided.

Yes, some computng resources will be required, but these are currently available within the school.

ENSC 474 – Multimedia Communications Engineering

Calendar description

This course covers the technical bases for multimedia communications systems. The main topics are as follows: methods for audio and visual signal compression and processing; the communications requirements of multimedia systems, such as synchronization, quality of service and bandwidth; the architectures and protocols associated with multimedia communications networks.

Scope

This course provides a close look at strategies and technolgies for *communicating* multimedia information over networks. It is not a general overview of "multimedia", nor does it cover other advanced (and important) material such as filesystems and operating systems for multimedia.

Course Outline

1) System Definition [1 week].
    a) multimedia information: audio, video, text, graphics, hypermedia, transmission requirements (bit rates), synchronization requirements.
    b) requirements for interactive multimedia and continuous media transmission.
2) Audio visual analysis and processing [2 weeks].
    a) signal transforms (DCT, Karhunen Loéve, Haar etc.)
    b) signal processing (filtering, zooming, morphing, etc.)
    c) signal models
3) Compression algorithms for audio and visual information [5 weeks].
    a) lossy and lossless coding
    b) transform coding
    c) temporal and spatial prediction
    d) wavelet and subband expansions
    e) scalable coding and progressive transmission
    f) applications to modern compression standards such as H.324, CELP, JPEG and MPEG, et cetera.
4) Multimedia networks and their protocols [4 weeks].
    a) network architectures for multimedia
    b) protocols for multimedia transmission
    c) synchronization issues
    d) quality of service
    e) ATM, ISDN and wireless nets
5) Applications [1 week].

Laboratory

The laboratory equipment required for this course consists of PCs and UNIX workstations. We will install "free" and "homegrown" software for audio/visual codecs and image processing and will use programs such as netscape for the demonstration of multimedia documents. Existing network simulation software will be used for the networks part of the course.

Pre-requisites

The basic concepts of linear systems analysis using the Fourier transform; i.e., ENSC 281 or a suitable equivalent.

Textbook

John Buford, "Multimedia Systems", Addison Wesely, 1995.

Reference Materials

1) Books

- Tony Feldman, *Multimedia*, 1994
- Anil Jain, *Fundamentals of Digital Image Processing*, 1989
- Murat Tekalp, *Digital Video Processing*, Prentice Hall, 1995.
- L.R. Rabiner and R.W. Schafer, *Digital Processing of Speech Signal*, Prentice Hall, 1978.

2) Journals

- Communications of the ACM
- IEEE Signal Processing Magazine
- IEEE Communications Magazine
- IEEE Transactions on Communications
- IEEE Multimedia

2) Re-numbering of the Engineering Communication courses

Proposal — It is proposed to re-number the Engineering Communication sequence in the following manner:

ENSC 103-1 to ENSC 204-1
ENSC 104-1 to ENSC 203-1
ENSC 105-1 to ENSC 305-1
ENSC 106-1 to ENSC 306-1
ENSC 107-1 to ENSC 407-1
ENSC 108-0 to ENSC 408-0

Rationale — The major reason for this change is that it reflects the year and the level at which the course is taught while maintaining the sense of a sequence of related courses. The later courses also build upon earlier ones, allowing for a higher levels of problem solving and place more demands in terms of critical thinking.

Note that the order of the ENSC 103 and ENSC 104 is also reversed in this re-numbering exercise. The rational for it is that this reversal of the order of the material creates a more logical sequence of course within the ENSC Communication Program in relation to what is being taught in ENSC 222, an electronics lecture/lab course that covers material best taken before undertaking ENSC 103. On the other hand ENSC 104 does not build upon knowledge from other ENSC courses and could easily be handled by the students at the beginning of the second year.

Remark — As a result of the above change all references to ENSC 101-108 on pages 71-73, as well as 208 should be revised along the above line.

3) Changes to the wording of the admission criteria

Proposal — To change the admission criteria on page 71 of the Calendar, second paragraph under the topic "Admission"

FROM:

Applicants from BC high schools will be expected to have the following subjects at the Grade 12 level: English, Algebra, Physics, Chemistry. It is strongly advised that students complete Grade 12 Computing. Admission to the program is limited and selective, based on previous academic performance.

Note: The recommended date of receipt of all applications for admission by those whose goal is the BASc Engineering Science program is June 30.

TO:

Applicants from the BC high schools are required to have taken the following subjects: English-12, Mathematics-12, Physics-12, and Chemistry-12. Students are also strongly advised to complete Computer Science-12. Admission to the program is limited and very competitive: an "A" standing in Math, Physics, and Chemistry and at least a "B" standing

in English are expected. Non-academic components such as work experience, extra curricular activities and science fair participation are also considered during the admission process.

Note: Students interested in the B.A.Sc. Engineering Science program should apply as early as possible since the program usually fills early. At the very latest, applications should be received by June 30.

Rationale

Nick Heath in the Registrar's office has suggested that we change our Calendar information in the "Admission" section to indicate more clearly the criteria that we use. The UCC agrees.

S.96-2b

FOR INFORMATION

School of Communication

Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 95 - 21 a:

Change of prerequisite: CMNS 473-4, CMNS 498-10

FOR INFORMATION

S.96-2c

School of Computing Science

Acting under delegated authority of Senate, SCUS has approved the following request as detailed in SCUS 95 - 21 d:

Waiver to permit offering of CMPT 212-3 (Object-Oriented Applications Design in C++) in Summer 96-2
(New course approved by Senate November 6, 1995)

FOR INFORMATION

S.96-2d

School of Kinesiology

Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 95 - 21 c

KIN 207-3	Change of description
KIN 467-3	Change of title, description and prerequisites
KIN 485-4	Change of title and description