S.94-10

SIMON FRASER UNIVERSITY

Memorandum

To: Senate

From: J.M. Munro, Chair
Senate Committee on Academic Planning

Date: January 26, 1994

Subject: Undergraduate Curriculum Revisions
Faculty of Applied Sciences

Action undertaken by the Senate Committee on Undergraduate Studies, the Senate Committee on Enrolment Management and Planning, the Senate Undergraduate Admissions Board, 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.94-10 as follows:
- School of Kinesiology"

As Senate will see from the documentation on pages 88 and 89, SCAP disagrees with the action of SUAB in rejecting the recommendation that the high school science courses be required for direct admission of high school students and college transfer students into the major program. SCAP is strongly of the opinion that the "recommended" courses should be "required" courses as the proposal originally suggested.

SCAR has reviewed the documentation as set out in S. 94-10, and notes that within their specific terms of reference, SCAP and SUAB have arrived at different recommendations relating to the requirements for admission to the Kinesiology Program. It is the recommendation of SCAR that Senate resolve this issue.

School of Kinesiology

SCUS Reference: SCUS 93 - 38
SCAP Reference: SCAP 93 - 45b

1) Course deletions:
   KIN 341 - 3 Sports Medicine I
   KIN 441 - 3 Sports Medicine II

2) New course:
   KIN 221 - 3 Special Topics in Kinesiology

3) Restructuring of the requirements for an honors degree in Kinesiology including
   New course
   KIN 497 - 3 Undergraduate Honors Thesis Proposal
   Change of credit hours for KIN 499 - from 15 credits to 12 credits

4) Reorganization of biomechanics courses including
   New courses
   KIN 201 - 3 Basic Biomechanics
   KIN 301 - 3 Biomechanics Laboratory
   Deletion of
   KIN 401 - 4 Mechanics of Human Movement
   Change of credit hours, prerequisites, vector -KIN 402

5) New courses:
   KIN 207 - 3 Information Processing in Human Motor Systems
   KIN 412 - 3 Molecular and Cellular Cardiology
   KIN 418 - 4 Electrophysiological Techniques Laboratory

6) New courses for Human Factors/Ergonomics concentration
   KIN 280 - 3 Introduction to Human Factors/Ergonomics
   KIN 380 - 3 Occupational Biomechanics
   KIN 382 - 3 Physical Hazards in the Workplace
   KIN 383 - 3 Human-Machine and Human-Computer Interaction
   KIN 486 - 3 Industrial Design

7) Deletion of
KIN 480 - 3 Human Factors in Working Environments

8) Change to Major program requirements

9) Delete B.Sc. Honours in Applied Physiology Program and B.Sc. Honours in Sport Science Program

10) Change to Minor program requirements

11) Delete Post Baccalaureate Diploma in Occupational Science

12) Change to Certificate in Health and Fitness Studies

13) Additional Calendar statement re grade of C- or better in prerequisite

14) Admission to the Major Program in Kinesiology

For Information:
Acting under delegated authority of Senate, SCUS has approved the following revisions a
detailed in SCUS 93 - 38

Change of prerequisites: KIN 205, 305, 306, 142, 303

To: Senate Committee on Agenda and Rules

From: Craig Asmundson
UCC Chair
School of Kinesiology

Subject: Kinesiology Calendar Changes For Discussion At Senate Meeting On Feb. 14

Date: January 20/94

The Calendar changes described below were approved at School of Kinesiology meetings on September 16, September 23, and October 1, 1993, and at a Faculty of Applied Sciences UCC meeting on October 13, 1993.

1. Deletion of Kinesiology 341 and 441 from the Calendar. Please refer to the attached one page rationale on page 9.

2. **Proposal:** for KIN 205, change the prerequisites from "**BISC 101**, CHEM 102, and Physics 101" to "**BICH 221**, CHEM 102, and Physics 101".
   Justification: All students in KIN 205 will now have a similar background and the first four to five weeks of the semester won't have to be spent covering basic celluar biology concepts.

3. **Proposal:** KIN 305 & 306 - remove BICH 221 as a prerequisite for these courses because BICH 221 will be a prerequisite for KIN 205 and KIN 205 is a prerequisite for KIN 305 and 306.

4. **Proposal:** for KIN 142 we should have the same prerequisites as for KIN 105 -"Grade 11 biology, chemistry, and physics are recommended."
   Justification: no prerequisites are currently listed for this course in the Calendar. These prerequisites would not prevent students from taking the course but they would indicate to students that this is a science course and that a basic knowledge of biology, chemistry, and physics would be useful.

5. **Proposal:** For Kin 303, add Kin 142 as a prerequisite so that the prerequisite description in the Calendar reads "Kin 142 and 60 credit hours".
   Justification: Students entering Kin 303 should have a knowledge of skeletal anatomy, basic kinanthropometry and human performance measurement.

6. New course proposal - Kinesiology 221-3 - "Special Topics in Kinesiology". (page 10)

7. Restructuring of the requirements for an honors degree in Kinesiology (page 13).
   a) Proposal for a new course - KIN 497-3 - "Undergraduate Honors Thesis Proposal".
   b) Changes to KIN 499 - "Individual Study Semester" - change from a 15 credit course to a 12 credit course. Some changes have also been made to the Calendar description for KIN 499-12.

8. Reorganization of biomechanics courses (page 30).
   a) Creation of Kinesiology 201-3 - "Basic Biomechanics"
   b) Creation of Kinesiology 301-3 - "Biomechanics Laboratory"
   c) Alterations to Kinesiology 402-3 - "Mechanical Properties of Tissues"

9. New course proposal - KIN 207-3 - "Information Processing In Human Motor Systems" (page 46).

10. New course proposal - KIN 412-3 - "Molecular and Cellular Cardiology" (page 50).

11. New course proposal - KIN 418-4 - "Electrophysiological Techniques Laboratory" (page 54).

12. New course proposals for a Human Factors/Ergonomics concentration. A rationale is given for the creation of this concentration in the School of Kinesiology on page 61. The following new courses have been proposed. Please refer to the attached course proposals.
   a) KIN 280-3 - "Introduction to Human Factors/Ergonomics " (page 62)
   b) KIN 380-3 - "Occupational Biomechanics " (page 65)
   c) KIN 382-3 - "Physical Hazards in the Workplace " (page 68)
   d) KIN 383-3 - "Human-Machine and Human-Computer Interaction " (page 74)
   e) KIN 486-3 - "Industrial Design " (page 79)

13. **Proposal:** KIN 480-3, "Human Factors in Working Environments" - delete this course from the Calendar.
   Justification: With the reorganization of the undergraduate program in Kinesiology and the development of a Human Factors/Ergonomics stream, this course has been replaced by new courses.

14. **Major program requirements**
   The School of Kinesiology has defined four Areas of Concentration for those wishing to take a more specialized approach to their studies in the field of Kinesiology. They are:

   - Active Health
   - Health and Physiological Sciences
   - Human Factors/Ergonomics
   - Human Movement Sciences

Each Area of Concentration has a set of recommended courses outside the core. The "core" refers to those aspects of the program that are required, regardless of Areas of Concentration. Choosing an Area of Concentration is not necessary to receive a Bachelor of Science (Kinesiology) degree.

For the 1994/95 Calendar year, the suggested pathway of courses for each of these concentrations will be described in brochures which will be available at the Kinesiology General Office. In either 1995/96 or 1996/97, the pathway of courses for each of these concentrations will be put into the Calendar.

The Major program requirements shown on pages 86-87 were approved at a Kinesiology school meeting on September 23, 1993. How do these new Major program requirements differ from the current Major program requirements as described on pages 75-76 of the 1993/94 Calendar?

a) BISC 102-4 has been dropped as a required course. This course covers plants, ecology, evolution and other topics which are not relevant to all Kinesiology majors. Students are exposed to many of these topics in Grade 12 biology or BISC 100 at SFU which is the Grade 12 equivalent bioscience course. BISC 102 is not a prerequisite for any Kinesiology course. It is a prerequisite for BICH 221, but I have been told by both Lin Kemp who is the UCC Chair in Biosciences and Thor Borgford who is involved in the Biochemistry program, that Kinesiology majors will be able to have the BISC 102 prerequisite waived for BICH 221.

b) Five credits of chemistry have been dropped - either the combination of CHEM 103-3 and 118-2 or the combination of CHEM 250-3 and 255-2. None of these four courses are prerequisites for any Kinesiology course. CHEM 102-3 is a prerequisite for KIN 205 while CHEM 150-3 and 155-2 are prerequisites for KIN 305 and 306. If students want to take more chemistry credits, they will be able to do this. Students in the Health and Physiological Sciences concentration will require 20 credits of chemistry to fulfill medical school requirements. Please also note that in the Kinesiology Undergraduate Program survey which was conducted last semester, with the exception of CHEM 150 (52%), only 30-40 percent of Kinesiology majors rated the required chemistry courses as being relevant to the Majors Program.

c) KIN 201-3, "Introduction to Biomechanics" - this will replace Kin 401 as the required biomechanics course.

d) KIN 207-3, "Information Processing in Human Motor Systems" - this is a new core course.

e) Lower division elective requirements - please refer to page 86. A minimum of six credit hours must be selected from non-science schools/departments. The Faculty of Business Administration and the Department of Philosophy have been added to the list of selected non-science schools/departments. Courses from these areas will be useful to students in some of the concentrations.

f) Upper division requirements (page 87):
(i) STATS 301-3, "Statistics for the Life Sciences" - this is a new course which will appear in the 1994/95 Calendar. The course has been designed with participation of representatives from Kinesiology, Biosciences, Biochemistry and Statistics. In the Kinesiology Undergraduate Program survey, in response to the question, "Are there any courses that aren't presently part of the requirements for a Kinesiology Major but that you believe should be part of the required course load", the most frequent response was to include a statistics/research design course.

(ii) The number of Kinesiology upper division elective credits has been changed from 26 to 27. The newly proposed upper division courses (KIN 301-3, 380-3, 382-3, 383-3, 412-3, 418-4, 426-3, 486-3) have been added to the list of Kinesiology upper division courses to choose from.

(iii) The following statement has been added to the Calendar, regarding upper division electives - "Students may substitute BICH 321 to help satisfy this requirement." A number of Kinesiology majors are pre-med. students who will choose the Health and Physiological Sciences concentration. BICH 321 will be a required course for medical school admission in the 1994/95 Calendar. By allowing these students to count BICH 321 as Kinesiology upper division elective credit, it frees up some unspecified elective credits for these students who have only a small number of unspecified credits in their programs, and it allows them the opportunity to take one more course for their own personal interest from any area of the University.

15. **Proposal:** Delete the BSc Honors in Applied Physiology program and the BSc Honors in Sport Science program.

Justification:

a) Both of these programs are rigid and offer students very little flexibility. For the Honors in Applied Physiology program, 130 of the 132 credits are specified courses. Furthermore, 72 of these credits must be upper level credits. For the Honors in Sports Science program, 128 of the 132 credits are specified courses. The stringent requirements and lack of flexibility in these programs are inconsistent with the Calendar changes that were made for the 1993/94 Calendar where the required number of upper division credits for the major program(54 credits --> 45 credits) and the honors program(72 credits --> 60 credits) were reduced.

b) We now have areas of concentration in Physiological Sciences and Active Health and along with our undergraduate honors research courses, KIN 497 and KIN 499, students can obtain a specialization in applied physiology or sports sciences without having to adhere to a very rigid program.

c) The enrolment in these honors programs has been low for the reasons described above.

16. **Kinesiology Minor Program** :

a) Regulations regarding application for a Minor in Kinesiology - add the following sentences to the Calendar:

"Application for a Minor in Kinesiology requires:

(i) completion of KIN 142 and KIN 105 (or KIN 205) with a minimum "C" grade in each

(ii) submission of a completed Program Approval form to the Undergraduate Advisor"

b) Add the following sentence to the Calendar under requirements for a Minor in Kinesiology: "A minimum G.P.A. of 2.00 calculated from those upper division Kinesiology courses used to satisfy the requirements for a Minor in Kinesiology."

Justification:

a) We currently don't have any regulations in the Calendar regarding application and acceptance as a Minor in Kinesiology. Kinesiology 105 and 142 are the two required lower division Kinesiology courses that are required for the Minor program. If students obtain less than "C" letter grades in these two courses, it is unlikely that they will be able to perform adequately in upper division Kinesiology courses.

b) Currently a student majoring in a subject area outside of Kinesiology and also enrolled in the Kinesiology Minor Program could obtain the Minor with an average grade point of less than 2.00 in the upper division Kinesiology courses used to satisfy the requirements for a Minor in Kinesiology.

17. **Proposal:** Delete the Post Baccalaureate Diploma in Occupational Science from the Calendar.
Justification: The proposed concentration in Human Factors/Ergonomics will provide undergraduate training in this area which could not be matched within the confines (30 credits) of a PBD.

18. **Certificate in Health and Fitness Studies** - Add the following sentence to the Calendar: "A minimum grade point of at least 2.00 is required, calculated on all courses counting towards the certificate."
Justification: Currently a student majoring in a subject area outside of Kinesiology and also enrolled in the Certificate in Health and Fitness Studies program could obtain the certificate with an average grade point of less than 2.00 in the certificate courses.

19. **Proposal:** addition to the Calendar in the section where the descriptions of Kinesiology courses are given - "Students wishing to register for Kinesiology courses must have obtained a grade of C- or better in prerequisite courses."
Justification: The School of Kinesiology currently has the following statement in the Calendar - "All courses listed as required for the major must be completed at a grade of C- or higher." However, because the proposed sentence shown above isn't in the Calendar, students during telephone registration are allowed into courses even if they have a "D" letter grade in a prerequisite course.

20. **Admission into the Major Program in Kinesiology:**
Please refer to page 88.
a) Internal transfer students from within SFU
b) Students from secondary schools
c) Transfer students from recognized post-secondary institutions

Background information regarding a direct admission proposal for the School of Kinesiology is given on pages 90-91.

COURSE DELETION AND RATIONALE

School of Kinesiology

Course Deletions:

Kinesiology 341-3 - "Sports Medicine I"

Kinesiology 441-3 - "Sports Medicine II"

Rationale - The professor who has been teaching this course for the past 10 years, Dr. Murray Allen, departed from SFU at the end of August 1993.

These sports medicine courses were at one time very popular, but this has changed. The popularity of sports medicine has decreased as the field has become saturated with practitioners. For Kinesiology graduates, this is even more of a factor as they realize that they cannot apply their knowledge without a medical degree(M.D.). Furthermore, the B.C. College of Physicians and Surgeons objected to the use of the word "medicine" in the title of these courses.

The "sports injury" material from Kin 341 and 441 that is relevant to kinesiologists can be covered in one course, Kinesiology 241, that is taught either by Dr. Tom Richardson or by Dr. Don Hedges. Other material from Kin 341 and 441 related to the field of exercise rehabilitation and to the problem repetitive strain injuries in the workplace will be covered, along with other topics, in a new course - Kinesiology 481, "Activity Generated Musculoskeletal Disorders", which will be brought forward for the 1995/96 Calendar. This course will probably be taught as a special topics course in the 1994/95 academic year.

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

KINESIOLOGY 221-3: SPECIAL TOPICS IN KINESIOLOGY

RATIONALE:

The School of Kinesiology needs a lower division special topics course to provide a vehicle for pilot testing new lower division courses before they go into the Calendar with their own specific course number. Having a lower division special topics course also allows the possibility of having adjunct professors or visiting professors teach a lower division course related to their area of expertise on a one-time basis.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department:** Kinesiology

Abbreviation Code: KIN **Course #:** 221 **Credit Hrs:** 3 **Vector:** 3-1-0

Title of Course: Special Topics in Kinesiology

Calendar Description of Course:
Selected topics in areas not currently offered within the undergraduate course offerings in the School of Kinesiology.

Nature of Course: Three, one hour lectures per week plus one hour of tutorial per week

Prerequisites (or special instructions): To be announced in the Course Timetable and Registration Instructions.

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. **Scheduling**

How frequently will the course be offered? Once every 3-6 semesters.

Semester in which the course will first be offered? Unknown at present time.

Which of your present faculty would be available to make the proposed offering possible? Any faculty member in the School of Kinesiology.

3. **Objectives of the Course:**
To provide a vehicle for pilot testing new lower division courses before they go into the Calendar with their own specific course number.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:
Faculty - none
Staff - none
Library* - none
Audio Visual - none
Space - none
Equipment - none

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5. **Approval**

Date:	19 Oct 1993	Oct. 21, 1993.	
	[signature]	Parveen Bawa	
	(Department Chair)	(Dean)	(Chair, SCUS)

School of Kinesiology

Library Resources for New Courses

Course number and name:
Kinesiology 221-3, "Special Topics in Kinesiology"

Are the current SFU library resources adequate for this course?
YES

What additional library resources are essential for the offering of this course? None

1. **Textbooks** - this can't be specified at the present time because it will vary each time the course is offered, depending on the area which the course covers and who teaches the course.

2. **Journals** - none

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - none
2. Journals - none

Faculty member making course proposal: Craig Asmundson

Signature: R C Asmundson Date: Oct 4/93

Restructuring of the Requirements for an Honors Degree in Kinesiology - Overview

Present requirements: Students wishing to graduate with a Kin. (Hons) degree must have 132 credits, and must complete Kin 499-15 (Undergraduate Thesis).
Proposed changes: The proposal is to change the credit rating of Kin 499 from 15 to 12 credits, and require that students complete an undergraduate honours thesis proposal, the semester preceding the Kin 499. It is proposed that a new course be introduced (Kin 497-3) and identified as an Undergraduate Honours Thesis Proposal (i.e. Kin 497-3: Undergraduate Thesis Honours Proposal).

Rationale

Currently, students register for Kin 499 at the end of the semester preceding their undergraduate thesis work. They then have 4 months within which to conduct a literature review, develop a research hypothesis, establish a research paradigm, set-up their experimental arrangement, learn to use the equipment, conduct the research, and write it up for formal presentation. In many cases, the experiments have to be approved by the appropriate Ethics Committees, and this may require several weeks. Due to the usual lack of preparation of students in their chosen field of study, proposals for Kin 499 are normally written with the help of faculty. Students have little input at the proposal stage. Also, only brief outlines are submitted for Kin 499.

The quality of our undergraduate theses may be compromised by the magnitude of the work, which needs to be completed in one semester. The intent of the present proposal is to allow students to conduct a literature review, and discuss potential research questions with the chosen supervisor. By registering in a Kin 497 the semester prior to the Kin 499, the student can develop a formal research proposal. By doing so, the feasability of the research may be assessed by the faculty supervisor and the UCC Chair. Also, the student has the opportunity to interact with other faculty and graduate students and thus obtain constructive input regarding the proposed project. It is anticipated that the students may be required by their faculty supervisor to present their proposal at laboratory meetings. Since students completing an Honours degree are the ones that usually pursue graduate work, the experience of writing and presenting a research proposal will prepare them for the process at the graduate level. For those pursuing professional and other vocations, the experience will teach them the proper process for submitting research applications.

By working with the student on a Kin 497 prior to a Kin 499, the faculty member may assess the students interest and research potential. Continuation of the collaboration (i.e. Kin 499) may be contingent upon the student successfully completing the Kin 497. The Kin 497 then acts as a trial period for both student and faculty member.

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

KIN 497-3 Kinesiology Undergraduate Honours Thesis Proposal

RATIONALE:

Currently, students register for Kin 499 at the end of the semester preceding their undergraduate thesis work. They then have 4 months within which to conduct a literature review, develop a research hypothesis, establish a research paradigm, set-up their experimental arrangement, learn to use the equipment, conduct the research, and write it up for formal presentation. In many cases, the experiments have to be approved by the appropriate Ethics Committees, and this may require several weeks. Due to the usual lack of preparation of students in their chosen field of study, proposals for Kin 499 are normally written with the help of faculty. Students have little input at the proposal stage. Also, only brief outlines are submitted for Kin 499.

The quality of our undergraduate theses may be compromised by the magnitude of the work, which needs to be completed in one semester. The intent of the present proposal is to allow students to conduct a literature review, and discuss potential research questions with the chosen supervisor. By registering in a Kin 497 the semester prior to the Kin 499, the student can develop a formal research proposal. By doing so, the feasability of the research may be assessed by the faculty supervisor and the UCC Chair. Also, the student has the opportunity to interact with other faculty and graduate students and thus obtain constructive input regarding his proposed project. It is anticipated that the students may be required by their faculty supervisor to present their proposal at laboratory meetings. Since students completing an Honours degree are the ones that usually pursue graduate work, the experience of writing and presenting a research proposal will prepare them for the process at the graduate level. For those pursuing professional and other vocations, the experience will teach them the proper process for submitting research applications.

By working with the student on a Kin 497 prior to a Kin 499, the faculty member may assess the students interest and research potential. Continuation of the collaboration (i.e. Kin 499) may be contingent upon the student successfully completing the Kin 497. The Kin 497 then acts as a trial period for both student and faculty member.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department Kinesiology**

Abbreviation Code: Kin **Course #: 497** **Credit Hrs: 3** **Vector: 0-3-0**

Title of Course: Kinesiology Undergraduate Honours Thesis Proposal

Calendar Description of Course: Supervised directed study and research leading to the development of a formal undergradute thesis proposal for work to be conducted in Kin 499-12. The activity in the Kin 497 may be augmented by other course work and a pilot study. In cases where an industrial/community partner is involved in the development of a project, the work need not be conducted at Simon Fraser Univeristy and may be completed external to SFU. Supervision of the Kin 497 will be conducted by a suitable faculty member, but may be co-supervised by an industrial/community partner. Supervisor(s) must be approved by the Undergraduate Curriculum Committee. The plan of activities for each Kin 497-3 should be submitted to the Chair of the Undergraduate Curriculum Committee for approval one month prior to the semester in which the course will be taken.

Nature of Course: Directed studies

Prerequisites (or special instructions): Only students in the Honours programme may register for Kin 497; 90 credit hours, Stats 301, and permission of the Chair, Undergraduate Curriculum Committee.

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. **Scheduling**

How frequently will the course be offered? As requested by students.

Semester in which the course will first be offered? 94-3

Which of your present faculty would be available to make the proposed offering possible? All faculty.

3. **Objectives of the Course:** The quality of our undergraduate theses may be compromised by the magnitude of the work, which needs to be completed in one semester. The intent of the present proposal is to allow students to conduct a literature review, and discuss potential research questions with the chosen supervisor. By registering in a Kin 497 the semester prior to the Kin 499, the student can develop a formal research proposal. By doing so, the feasability of the research may be assessed by the faculty supervisor and the UCC Chair. Also, the student has the opportunity to interact with other faculty and graduate students and thus obtain constructive input regarding his proposed project. It is anticipated that the students may be required by their faculty supervisor to present their proposal at laboratory meetings. Since students completing an Honours degree are the ones that usually pursue graduate work, the experience of writing and presenting a research proposal will prepare them for the process at the graduate level. For those pursuing professional and other vocations, the experience will teach them the proper process for submitting research applications.
By working with the student on a Kin 497 prior to a Kin 499, the faculty member may assess the students interest and research potential. Continuation of the collaboration (i.e. Kin 499) may be contingent upon the student successfully completing the Kin 497. The Kin 497 then acts as a trial period for both student and faculty member.

4. **Budgetary and Space Requirements**

NO ADDITIONAL RESOURCES REQUIRED.

5. **Approval** (KIN 497)

Date: 19 OCT 1993 Oct. 21, 1993

(Department Chair) (Dean) (Chair, SCUS)

Course outline:

Kin 497: Undergraduate Honours Thesis Proposal

CALENDAR DESCRIPTION

Supervised directed study and research leading to the development of a formal undergraduate thesis proposal for work to be conducted in Kin 499-12. The activity in the Kin 497 may be augmented by other course work and a pilot study. In cases where an industrial/community partner is involved in the development of a project, the work need not be conducted at Simon Fraser University and may be completed external to SFU. Supervision of the Kin 497 will be conducted by a suitable faculty member, but may be co-supervised by an industrial/community partner. Supervisor(s) must be approved by the Undergraduate Curriculum Committee. The plan of activities for each Kin 497-3 should be submitted to the Chair of the Undergraduate Curriculum Committee for approval one month prior to the semester in which the course will be taken. Prerequisite: only students in the Honours programme may register for Kin 497; 90 credit hours, Stats 301, and permission of the Chair, Undergraduate Curriculum Committee.

GENERAL CONSIDERATIONS

Students wishing to pursue an Honours degree in Kinesiology are required to complete an Undergraduate Honours Thesis Proposal.

Students should submit a plan of activities for each Kin 497 to the Chairperson of the Undergraduate Curriculum Committee (UCC) for approval at least one month prior to the semester in which the course will be taken. The plan of activities should indicate the grading scheme and should be signed by both student and supervisor.

Deadlines

The following deadlines must be met by students registered in Kin 497:

6th week of classes:	Initial draft of thesis proposal to be submitted to supervisor(s).
7th week of classes:	Application for approval of the research should be submitted to the University Ethics Review Committee.
8th week of classes:	Completed draft.
12th week of classes:	Final draft signed by supervisor(s) and Chairperson, UCC.

Late proposals will be accepted only if the Chairperson responds favourably to a written request received before the final deadline. Students wishing to pursue a Kin 499 may not defer the grade to the next semester. All requirements must be completed before the beginning of the semester in which the Kin 499 will be conducted. Students should ensure that the research proposal has received approval of the University Ethics Review Committee, prior to initiating any research related to the Kin 499.

Audience

The thesis proposal is written for the upper level students and faculty of the School of Kinesiology, and you can therefore assume a high level of knowledge, although some may be less familiar than others with the technical aspects of your project or its practical applications. Think carefully about what the audience may need to know in order to judge the value and feasibility of your project. When in doubt, err on the side of providing too much rather than too little information.

Purpose

The goal of your proposal is to persuade the audience (faculty and students) that your thesis is worthwhile. To do so, you must convince them of the following:

- The project is worth doing insofar as it fills an existing need or advances research or technology in some significant way;
- It is technically feasible;
- You have the technical expertise necessary to carry it out;
- You have a clear sense of what the project entails and of the methods involved in completing it successfully;
- The necessary facilities and funding are available;
- It can be completed in the time allowed;
- It is appropriately challenging for a senior Kinesiology student.
- The research meets the guidelines of the University Ethics Review Committe.

CONTENT CONSIDERATIONS

The proposal should contain the following main sections: Abstract, Objectives, Background, Introduction, Methodology, Analyses, References.

Abstract

The abstract should be a maximum of 500 words and should summarize the objectives of the thesis, the proposed methodology and analyses of results.

Objectives

The objectives of the thesis should be clearly specified. This may be in the form of research questions which will be addressed or a list of hypotheses which will be tested. Normally this section should not exceed one page.

Background

The background section should provide a concise review of the pertinent literature. Include any theoretical/historical information which may help the committee member who is least familiar with the project to understand it well enough to place it in the appropriate context and to judge its contribution to the field. Since this section is essentially a literature review, the length may vary considerably. You should normally not need to exceed 20 pages.

Introduction

The introduction should provide relevant background information on the specific research question you wish to address. It should provide a rationale for proposed project. Since the Background section provides a concise and pertinent review of the research field, your Introduction can be quite concise and should be no longer than 4 pages (recommended length is two to three pages).

Methods

This section should outline in detail the manner in which you wish to conduct the project. Divide this section into subsections and discuss each one separately:

• Protocol. Indicate the protocol you will employ. In the event that your project requires approval by the University Ethics Review Committee, append either the letter of approval from the University Ethics Committee, or the application to the Committee for approval of the project.

• Instrumentation. Outline the instrumentation you will use and explain how it will be calibrated and how measurements will be made. Include a statement regarding the availability, location and functional status of the equipment.

The length of the Methods section will depend on the nature of the protocol. You should not feel constrained by length requirements in this section, but should incorporate as much detail as you feel is necessary. Do not forget to include Model names of equipment you will be using, as well as the name and location of the manufacturer. Normally, you should be able to outline in detail your proposed methodology in four to six pages.

Analyses of Results

Outline the analyses of results you will perform. Explain how you will test each hypotheses listed in the Objectives section. You should provide a calculation of the power of any statistical tests you will perform. You may provide graphical presentations of hypothetical results to aid your description of the analyses of results.

Similar to the Methods section, you should explain in as much detail as you deem necessary, the analyses you will conduct once the data are collected. Normally, the length of this section should not exceed six pages. Your committee will be evaluating whether you will be able to accept or reject your hypothesis based on the results of your analyses. In the event that you have been able to complete a pilot study, you may wish to present the results of your pilot study to demonstrate how the analyses will be conducted. It is appropriate to indicate the computer software you will be using for analysing your results.

Some important items which should be incorporated in this section include:

• a calculation of the number of trials needed to achieve a suitable power of statistical analyses.
• a clear definition of the probability you will accept for making a Type I and Type II error.
• a clear description of the statistical analyses you will conduct; be prepared to defend your choice of statistical procedures.

The structure of this section will depend a great deal on the nature of the experiment you are proposing. For example, if you are proposing to develop a mathematical model to simulate a physiological response, your presentation in this section will be quite different than for an experimental study. Nevertheless, having identified the mathematical procedures you will undertake to develop the model in the Methods section, you should present an outline of how you plan to test your model in this section.

Conclusions

Summarize the implications of your work and, if appropriate, the practical implications of your results. Expand upon those points most likely to convince your committee that your proposed project will both succeed and make a valuable contribution to the field. Normally this section should not exceed one page.

References

You should use the form of referencing recommended by the Canadian Journal of Physiology and Pharmacology. Refer to the journal for guidelines.

Appendices

Place as much turgid material as possible in appendices (i.e. mathematical derivations, computer programs, elaborate diagrams of equipment). In the event that your proposed research requires the approval of the University Ethics Review Committee, then the letter approval and/or your application to the Committee should be in an Appendix.

FORMAT CONSIDERATIONS

The proposal should include the following pages or sections:

Title page
Acceptance Form (available from Undergraduate Secretary)
Abstract
Table of contents
List of Figures and Tables
Objectives
Background
Introduction
Methods
Analyses of Results
Conclusion
References
Appendices (if required)

ACCEPTANCE PROCEDURE

Your completed proposal should be read and accepted by your supervisor(s) and by the Chairperson of the Undergraduate Curriculum Committee. At any stage in the acceptance procedure, the proposal may be returned to you for revision. To avoid making this process any longer or more complicated than necessary, we suggest that before submitting your proposal officially, you have your supervisor read and comment on it.

GRADING

The development of your proposal includes several important components, and you will be graded on all of them accordingly. These include:

Preparation (literature review, meetings with your supervisor and pilot study).	30%
Oral presentation (to a forum determined by your supervisor).	10%
The written submission	60%

School of Kinesiology

Library Resources for New Courses

Course number and name: Kin 497

Are the current SFU library resources adequate for this course?
YES

What additional library resources are essential for the offering of this course? None.

Faculty member making course proposal:

Signature: R C Richardson Date: Oct 4/93

COURSE ALTERATION AND RATIONALE

SCHOOL OF KINESIOLOGY

FROM: Kin 499-15: Individual Study Semester

Directed study and research project in Kinesiology. With the advice of two supervisors, one of whom must be a faculty member in the School of Kinesiology, the student will submit a proposal (500 words) to the Kinesiology Undergraduate Curriculum Committee before the end of classes in the semester previous to the one in which the student wishes to undertake KIN 499. Once the project is approved, the student will carry out research and present the work in the form of a written scientific paper by the last day of classes of that semester. The paper will also be presented orally as a seminar in an open forum at the end of the semester. Prerequisites: a minimum CGPA of 3.0, 90 completed credit hours and permission of the school. Students with credit for KIN 499 may not take either KIN 496 or KIN 498 for furter credit. Kinesiology majors are permitted to count a maximum of six credits from KIN 496, 498 and 499 towards their degrees. A student may not register for KIN 499 and Co-op (Kin 351, 352, 451, 452, 453) concurrently.

TO: ***Kin 499-12: Kinesiology Undergraduate Honours Thesis***

A thesis based on research previously proposed in Kin 497. Formal approval of the research topic is given by attaining a minimum grade of B in Kin 497. Regulations regarding the locale of the work, supervision and other arrangements, follow those for Kin 497. The written thesis should be submitted to the Chair of the Undergraduate Curriculum Committee by the last day of exams of the semester. The thesis will also be presented orally as a seminar in an open forum at the end of the semester. Prerequisites: Kin 497. Only students in the Honours programme may register for Kin 499. A student may register for one other course concurrently with Kin 499 with permission from the faculty supervisor for Kin 499.

RATIONALE: *Please see comments in covering letter.*

Course outline:

Kin 499: **Undergraduate Honours Thesis**

CALENDAR DESCRIPTION

A thesis based on research previously proposed in Kin 497. Formal approval of the research topic is given by attaining a minimum grade of B in Kin 497. Regulations regarding the locale of the work, supervision and other arrangements, follow those for Kin 497. The written thesis should be submitted to the Chair of the Undergraduate Curriculum Committee by the last day of exams of the semester. The thesis will also be presented orally as a seminar in an open forum at the end of the semester. Prerequisites: Kin 497. Only students in the Honours programme may register for Kin 499. A student may register for one other course concurrently with Kin 499 with permission from the faculty supervisor for Kin 499.

GENERAL CONSIDERATIONS

An undergraduate thesis should be based on the work proposed in Kin 497.

Deadlines

The following deadlines must be met:

11th week of semester:	Submit a draft to your supervisors.
12th week of semester:	Your final draft must be submitted to your supervisors and the Chair of the Undergraduate Curriculum Committee, and a date for your oral presentation set.
14th week of semester:	Final revisions must be completed and the thesis ready for binding. Once all revisions have been incorporated you should submit the thesis to the Chair, UCC.

Audience

Write your thesis for your peers. Imagine that it will be read by other senior Kinesiology students. Assume that your readers will not be specialists in your area and will likely be unfamiliar with some of the technical aspects of your project. Keep in mind that it is essential to provide such readers with appropriate background information.

Purpose

A successful undergraduate thesis will demonstrate your skill as a scientific-technical writer and your ability to integrate knowledge, to solve problems, to undertake and complete a complex and challenging project, and to maintain professional standards.

Supervisory Committee

In addition to a Senior Supervisor, who will be a faculty member in the School of Kinesiology, you should also have a co-supervisor. The co-supervisor need not be a faculty member at Simon Fraser University, but in such cases must be approved by the UCC.

Getting started

Be sure to allow sufficient time to revise your work. It is not uncommon to underestimate the amount of time required to write a report, and make matters worse by putting off the writing to the last possible minute. This combination of wishful thinking and procrastination is particularly dangerous when writing a relatively long report on a long-term project. The most productive approach is to write sections of the first draft as your work progresses. By making writing an integral part of your thesis project, instead of a separate and final step, you can significantly reduce the sense of drudgery and frustration which so often accompanies after-the-fact report writing. By drafting in stages, you can also help ensure the success of your project, because putting concepts into words may clarify your thinking and help bring potential problems into focus.

It is advisable to keep a daily record of your activities, especially of your practical work. You will be conducting many new practical procedures and may forget the finer details when it comes to the final write-up of your thesis. By keeping a daily log book of all your work, no matter how mundane, you will easily recall all your activities.

Copyright

If you reproduce copyrighted material, including illustrations or written material over 500 words in length, you must obtain written permission from the copyright holder.

The Oral Thesis Presentation

As you are writing your thesis, you should give some consideration to what you will include in your oral thesis presentation. In general, you are expected to give a 20 to 30 minute summary of the research and work upon which your thesis is based. You should arrange your oral presentation in somewhat the same manner as your written thesis. Due to the time limit, you should keep your background review to a minimum. Your main goal is to make your presentation concise, interesting and informative. Visual aids should be used to achieve this goal.

The Oral Thesis Presentation will be chaired by a faculty member designated by the Chair of the Undergraduate Curriculum Committee, and should be attended by at least one member of your supervisory committee. In the event that one member of your supervisory committee cannot attend the oral presentation, comments and questions from that member will be forwarded in writing to the Chair prior to your presentation.

Following your presentation, you are expected to answer questions from your supervisors and the audience (faculty, students and other observers). You will then be asked to leave the room, as the supervisory committee considers various issues related to your work (most notably, any revisions which you might be required to make). Finally, you will be asked to return to the room for the final comments of the committee. Answering questions and receiving comments from the committee generally takes about an hour.

CONTENT CONSIDERATIONS

Descriptions of the major sections of your thesis are outlined below.

Abstract

The abstract provides readers with an accurate summary of the scope and content of the thesis. It should briefly describe your project, its significance, the method of your research, your results, and your contribution to the field. Consider the abstract as a very short verion of your thesis which could be published as a separate document. Use the past tense, minimizing technical language and ensuring that any technical terms you do use are

either familiar to all potential readers or adequately defined. Include only information also found in the thesis.

Acknowledgements

Acknowledge the help you received from anyone who worked with you on your project or provided significant help in terms of advice, information, constructive criticism, financial support, or facilities.

Background

A concise literature review of the field should be provided in this section. You can imagine that the main text of your thesis (Abstract, Introduction, Methods, Results, Discussion, References) constitutes a research paper, as found in scholarly journals. Indeed, it should not exceed the normal length of such journal articles. However, a non-specialist may have dificulty in appreciating the significance of your work without being provided with a broader picture of the research field. The background is supposed to provide such a non-specialist with a clear and concise review of the area, and should highlight the controversial issues. It should also include relevant theoretical and/or historical background information necessary for the reader to understand the project, to place it in the appropriate context, or to judge its contribution to the field.

The Background section in your thesis is essentially an updated version of the Background section in your Thesis Proposal.

Introduction

In contrast to the Background, which provides a review of the area in general, the Introduction should focus on the specific issue being addressed by the thesis. It should present the current state of knowledge in the area and should explain how your research contributes to the field.

Methods

Your thesis must contain sufficient detail so that someone could replicate your study. This section should outline in detail the research design and experimental protocol, and should describe all the instrumentation used. Include the Model type and manufacturers' names of all materials and instrumentation used. Finally, describe all the variables you monitored and explain the manner in which your results were obtained (i.e. data acquisition). Normally, results are analysed using statistical procedures. Any such mathematical or statistical procedures used in the analyses of results should be described in the Methods section.

Results

The results section should describe the responses of all the variables you measured in your experiments. In addition to a description of the results, you should also outline the results of any statistical analyses conducted. This section should include not only a written description of the results obtained, but also graphical presentations.

Discussion

The results of your research needs to be discussed in detail. In particular, you should state whether your hypotheses were confirmed. You should discuss the constraints, failures and weaknesses of the project, emphasize its contribution ot the field, and provide recommendations for future studies. You may wish to structure your Discussion into subsections, each dealing with a particular finding. Strive for a strong final statement, perhaps by stressing the potential impact of your accomplishments.

References

References in your thesis should be cited according to an accepted format. It is recommended that you write the thesis in the format accepted by a journal in which you would like to publish your results. Each scientific journal includes a section on Instructions to Authors, and you are advised to follow such guidelines. A recommended journal, where you may find appropriate guidelines is the Canadian Journal of Physiology and Pharmacology.

Appendices

Place as much turgid material as possible in appendices (i.e. mathematical derivations, computer programs, elaborate diagrams of equipment designed). Your thesis should contain all the detail necessary for replication, but much of this detail should appear in the appendices rather than in the central chapters. Your chapters should provide sufficient detail and context so that readers can appreciate the full significance of your accomplishments, but an appendix is the appropriate place for those details which are only useful to someone who plans to apply your work, perhaps by acting upon a proposal for future work presented in your final chapter.

FORMAT CONSIDERATIONS

The following guidelines should be adhered to in writing the thesis.

Sections of the Thesis

You are expected to include the following sections in your thesis in the order listed below. Where applicable, the recommended length of each section is given in brackets:

Title Page
Approval Page
Abstract (500 words)
Acknowledgements (1 page)
Dedication (optional; 1 page)
Table of Contents
List of Figures and Tables
Objectives (1 page)
Background (not to exceed 20 pages)
Introduction (not to exceed 4 pages)
Methods (not to exceed 6 pages)
Results (not to exceed 6 pages)
Discussion (not to exceed 6 pages)
Conclusions (1 page)
References
Appendices

Pagination

The sections from Title Page to List of Figures and Tables must be paginated in lower case Roman numerals (omit page number for Title page). The remainder of the text should be paginated in Arabic numerals.

Margins and paper

Margins must be 1.25 inches (3.2 cm) on the left side of the page and 1 inch (2.5 cm) on the top, bottom, and right sides. Ensure that page numbers, titles, and so on are within these margins as several mm will be trimmed from bound copies of the thesis. Use plain white, 8½" x 11" (21 x 28 cm) 20-lb. bond paper.

Typeface and Print Quality

Use the same type face throughout, with possible exception of appendices, which must nevertheless produce clear photocopies. Whether or not you use proportional spacing or justification is up to you (you may prefer the look of a justified page). The final draft of your thesis, with the possible exception of some appendices, must be letter-quality with crisp, black letters. You should use a laser printer for the final draft. Dot matrix print quality is not acceptable.

Submitting the Final Draft

After your thesis has been defended and final revisions approved by your supervisor(s), you must provide the School of Kinesiology with a faultless, letter quality copy. You are responsible for cost of printing the original copy of the thesis and of binding your copy. The School will pay for duplicating two copies and for binding two copies (one for the School and one for your senior supervisor). If you wish to print and bind additional copies of your thesis, you must indicate this at the time of submitting your final draft. You will be billed for the additional costs.

Sample Pages

The final two pages of this section provide samples of a thesis title page and an approval page.

TITLE OF THESIS
(in upper case letters, centred on appropriate number of lines)

by

Your Name
(in upper and lower case letters)

A THESIS SUBMITTED IN PARTIAL FULFILMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE (HONOURS)
in the School of Kinesiology

SIMON FRASER UNIVERSITY

(as shown here)

DATE
(Month Year)

APPROVAL

Name:
Degree:
Title of Thesis:

(signature line)

(Name)
Chairman
Undergraduate Curriculum Committee
School of Kinesiology, SFU

Examining Committee

Chairperson:

(signature line)

(Name)
(Position)
School of Kinesiology, SFU

Senior Supervisor:

(signature line)

(Name)
(Position)
(School or Department)

Co-supervisor:

(signature line)

(Name)
(Position)
(School/Department/Company)

Date Approved: _____

SUMMARY OF CURRICULUM CHANGES

SUMMARY OF ITEMS TO BE CONSIDERED

SCHOOL OF KINESIOLOGY

B.Sc. (Kinesiology) Calendar Entry
B.Sc. (Kinesiology) Major Program Requirements.

New Course Proposals
KIN 201
KIN 301

Course Deletion Proposal
KIN 401

Course Change Proposal
KIN 402 Credit hours, Prerequisites, Vector

SUMMARY OF THE RATIONALE FOR THESE CHANGES

The School of Kinesiology has three required upper-level laboratory courses (KIN 326, 401 and 407). As students often wait until close to completion of their degrees before applying to take these courses a shortage of space often occurs. In addition, laboratory courses are very demanding on faculty and T.A. time and departmental resources. The School of Kinesiology is presently developing streams within its undergraduate program. Due to continued budget cuts and enrollment increases, the School has decided that it would be prudent to reduce the number of laboratory courses required in the general Kinesiology core. Students will be able to take more specific applied laboratory courses related to their stream without generating a bottle neck problem similar to the one we experience with KIN 401.

The School has discussed this issue and has decided to retain KIN 407 as a core course and to delete KIN 401. However, it was agreed that only the laboratory component of KIN 401 be made a non-core area, and that the lecture material from KIN 401 be kept in the core. It is therefore proposed that a new course KIN 201 (which would comprise of the lecture material from KIN 401) be added to the core. KIN 201 would be a lecture course and the School of Kinesiology could offer it twice a year to more students than can currently be serviced by offering KIN 401 three times per year. In addition, the School will realize a considerable cost savings by these changes.

This proposed addition of KIN 201 obviously results in necessary alterations to KIN 401. KIN 401 will be deleted and a new laboratory course KIN 301 developed in its place. Due to the creation of KIN 201 and KIN 301 changes to o the existing KIN 402 are considered desirable. Specific rationale for these proposals is discussed with each individual proposal forms.

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

Basic Biomechanics KIN 201-3

RATIONALE:

Biomechanics is a core area of research in the School of Kinesiology. Presently, the biomechanics course KIN 401 is a required core course. If KIN 201 is approved KIN 401 will be deleted. The faculty of the School of Kinesiology have agreed that a new course at the 200 level should replace KIN 401 as the required biomechanics course. This lower designation will help the School's development of streams by allowing the specific streams to designate more specialized upper division credits.

A further benefit of this change is due to the fact that KIN 401 requires, (as will KIN 201) PHYS 101 as a prerequisite (which in turn requires MATH 151 or 154 as a prerequisite). Many KIN 401 students had forgotten some of the fundamentals of physics and calculus by the time they had occasion to apply them in this fourth year course and consequently struggled with the course material. Over the years, numerous students have suggested that it would be easier to take biomechanics soon after the calculus courses.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. CALENDAR INFORMATION **DEPARTMENT:** KINESIOLOGY

Abbreviation Code: KIN **Course #:** 201 **Credit hrs:** 3 **Vector** 3-1-0

Title of Course: Basic Biomechanics

Calendar description of course:

This course will cover the application of basic mechanics to human movement. It will provide students with a basic understanding of how forces act on body segments and how movements are produced. The subject matter of this course is relevant to quantifying all forms of physical activity, from activities of daily living, physically challenged movement patterns, to elite athletic performance. It also has applications in medical settings, including rehabilitation and sports medicine.

Nature of Course:
The course will consist of three hours of lecture and one hour of tutorial per week. Weekly reading assignments will be provided and discussed. Evaluation will consist of assignments, midterm and final exams.

Prerequisites: MATH 152 or 155, PHYS 101 or 120, KIN 142. Students with credit for KIN 401 may not take KIN 201 for further credit.

What course (courses), if any, is being dropped from the calendar if this course is approved: KIN 401 (if KIN 301 is approved)

2. Scheduling

How frequently will the course be offered? Twice per year.

Semester in which course will first be offered? Fall 1994.

Which of your present faculty would be available to make the proposed offering possible?

Dr. A.E. Chapman
Dr. T.E. Milner
Mr. A.J. Leyland

3. Objectives of the Course

This course is designed to give students a good working knowledge of the application of Newtonian mechanics to human movement. The subject matter in this course is relevant to many areas of kinesiological and medical study, including: occupational biomechanics; rehabilitation; physical education; sports performance; and sports medicine. Students will study fundamental mechanical concepts such as Newton's Laws of motion and learn the application of these laws to a variety of human movements. Students will develop an understanding of the possible inaccuracies involved in qualitative assessment of human movement and be introduced to the theory of quantitative biomechanical analysis of human motion.

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty	none
Staff	none
Library	none
Audio Visual	none
Space	none
Equipment	none (this is not a laboratory class)

5. Approval (KIN 201)

Date: 19 OCT 1993 JAH — Oct. 21, 1993 — _____

Director Kinesiology — Dean Applied Science — Chairman SCUS

COURSE OUTLINE/READING LIST

1. Course Name and Instructor

KIN 201 Basic Biomechanics
Instructor: Dr. A.E. Chapman, Dr. T.E. Milner or Mr. Tony Leyland

2. Course Objectives

This course is designed to give students a good working knowledge of the application of Newtonian mechanics to human movement. The subject matter in this course is relevant to many areas of Kinesiological and medical study, including: ergonomics (occupational biomechanics); rehabilitation; elite sports performance; sports medicine; and physical education.

Students will be reintroduced to fundamental mechanical concepts such as Newton's Laws of motion and learn the application of these laws to a variety of human movements. Students will develop an understanding of the inaccuracies involved in qualitative assessment of human movement and be introduced to the use of calculus to quantify human motion.

3. Required and Recommended Readings

There is no required text for this course. Students will be responsible for lecture material and will be assigned readings from some of the following texts.

Chapman, A.E. Biomechanics Booklet.
This booklet may be purchased for $10 from the course instructor.

Özkaya, N. and M. Nordin. Fundamentals of Biomechanics, Equilibrium, Motion and Deformation. Van Nostrand Reinhold, New York, 1991

Winter, D. Biomechanics and Motor Control of Human Movement (Second Edition) Wiley InterScience, New York, 1990.

Adrian, M.J. and J.M. Cooper. Biomechanics of Human Movement. Benchmark Press, Indianapolis, 1989.

Hall, S. Basic Biomechanics, Mosby, New York, 1989.

Hay, J.G. The Biomechanics of Sports Techniques (Third Edition). Prentice Hall, New Jersey, 1985.

Winter, D. Biomechanics of Human Movement. John Wiley & Sons, New York, 1979.

Dyson, G.H.G. The Mechanics of Athletics (Sixth edition). University of London Press, London, 1973.

4. Course Requirements and Grading Structure

Students will be responsible for lecture notes and assigned readings. A number of assignments will be allocated during the course.

Assignments	25%
Mid-term examination	25%
Final examination	50%

5. Course Outline

Forms of motion; linear kinematics; finite differentiation.
Equations of uniformly accelerated motion.
Vectors and projectiles.
Linear kinetics; Newton's laws of motion.
Resolution of forces; friction; work and energy.
Conservation of energy; power.
Centre of mass; momentum; conservation of momentum.
Impulse; collisions.
Angular motion; moments; couples; eccentric force.
Moment of inertia; transfer and conservation of angular momentum.
Rotational analogues of Newton's laws.
Levers; biomechanics of the skeletal and muscular system.
Linked segment models of the human body.
Centripetal, centrifugal and Coriolis forces.
Inverse dynamic analysis.
Joint force power; whole body mechanical work.
Fluid mechanics (aerodynamics).

SCHOOL OF KINESIOLOGY

Library Resources for New Courses

Course number and name: KIN 201 Basic Biomechanics

Are the current SFU library resources adequate for this course? YES

What additional library resources are essential for the offering of this course?

None

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price

Biomechanics of Human Movement. Adrian, M.J. & J.M. Cooper. Benchmark Press, Indianapolis, 1989.
ISBN #:
Price:

2. Journals - give title and library subscription price, if known

Faculty members making course proposal: Dr. A.E. Chapman
Dr. T.E. Milner
Mr. A.J. Leyland

Signature: for **Dr. A.E. Chapman** **Date:**

COURSE ALTERATION AND RATIONALE

SCHOOL OF KINESIOLOGY

FROM: Mechanics of Human Movement KIN 401-4

TO: Biomechanics Laboratory KIN 301-3

RATIONALE:

The present KIN 401 has six laboratory sessions to compliment its lecture component. Because that lecture component is being moved to the non-laboratory course KIN 201, KIN 401 either had to be deleted completely or have new laboratories added to it. The rationale for adding KIN 201 to the calendar is discussed within that new course proposal. The School of Kinesiology felt that laboratory course on the analysis of human movement from a biomechanical perspective must remain within the program. Students of Kinesiology should be well-versed in the practical application of the lecture material presented in KIN 201 "Basic Biomechanics". In rehabilitation, sports coaching, workplace evaluation and many other settings our students will be called on to measure and evaluate human performance in terms of variables such as force production, movement patterns, reduction of injury potential and economy of movement.

It was therefore decided to create KIN 301. The addition of a new faculty member and research equipment in the area of Biomechanics (Dr. T. Milner), has increased the potential number of laboratories that can be offered in Biomechanics. The six laboratories from KIN 401 will be altered and improved and along with some laboratories from KIN 402 and some new concepts. These changes will allow for the development of the 11 laboratories planned for KIN 301.

It was considered just changing the name, vector and content of KIN 401 to reflect these changes but it is hoped students will take KIN 301 shortly after KIN 201 so the lower number designation was considered desirable.

The rationale for moving some laboratories out of KIN 402 is explained in the course change proposal for KIN 402.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. CALENDAR INFORMATION **DEPARTMENT:** KINESIOLOGY

Abbreviation Code: KIN **Course #:** 301 **Credit hrs:** 3 **Vector** 0-0-4

Title of Course: Biomechanics Laboratory

Calendar description of course:

This laboratory course covers the quantitative biomechanical evaluation of human movement. Analysis techniques for quantifying motion of body segments in athletes, normal populations and special populations will be included. Experiments will measure force production in whole body activities such as walking and jumping. Experiments will also look at the nature of muscular force generation and the mechanical properties of the musculoskeletal system.

Nature of Course: The course will consist of four hours of laboratory per week.

Prerequisites: PHYS 130 or 131, KIN 201. Students with credit for KIN 401 may not take KIN 301 for further credit.

What course (courses), if any, is being dropped from the calendar if this course is approved: KIN 401

2. Scheduling

How frequently will the course be offered? Once, possibly twice per year.
Semester in which course will first be offered? Spring 1995.

Which of your present faculty would be available to make the proposed offering possible?

Dr. A.E. Chapman
Dr. T.E. Milner
Mr. A.J. Leyland

3. Objectives of the Course

This course is designed to give students a good working knowledge of the practical field and laboratory application of Newtonian mechanics to human movement. The subject matter in this course is relevant to many areas of Kinesiological and medical study, including: ergonomics (occupational biomechanics); rehabilitation; physical education; sports performance; and sports medicine. Students will learn how to use a variety of techniques using: the force platform; video and high speed filming analysis; the and methods of measuring mechanical properties of the musculoskeletal system. In short, this course will teach students practical skills in the quantitative biomechanical analysis of human motion.

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty	none
Staff	none
Library	none
Audio Visual	none
Space	none
Equipment	none

This course can be developed without additional equipment. However, we would have to utilize some faculty member's research equipment. As this is not ideal we will apply for funding to buy equipment for this course during regular faculty equipment budget determination. However, we do not wish to give the impression that the course cannot be offered unless equipment is purchased.

5. Approval KIN 301

Date: 19 OCT 1993 Oct. 21, 1993 _____

Director Kinesiology	Dean Applied Science	Chairman SCUS

COURSE OUTLINE/READING LIST

1. Course Name and Instructor

KIN 301 Biomechanics Laboratory
Instructor: Dr. A.E. Chapman, Dr. T.E. Milner or Mr. Tony Leyland

2. Course Objectives

This course is designed to give students a good working knowledge of the application of Newtonian mechanics to human movement. The subject matter in this course is relevant to many areas of Kinesiological and medical study, including: ergonomics (occupational biomechanics); rehabilitation; elite sports performance; sports medicine; and physical education.

Students will be reintroduced to fundamental mechanical concepts such as Newton's Laws of motion and learn the application of these laws to a variety of human movements. Students will develop an understanding of the inaccuracies involved in qualitative assessment of human movement and be introduced to the use of calculus to quantify human motion.

3. Required and Recommended Readings

Kinesiology 301 Laboratory Book. (To be developed).

Students will be responsible for laboratory content and may be assigned readings from some of the following texts.

Özkaya, N. and M. Nordin. Fundamentals of Biomechanics, Equilibrium, Motion and Deformation. Van Nostrand Reinhold, New York, 1991

Winter, D. Biomechanics and Motor Control of Human Movement (Second Edition) Wiley InterScience, New York, 1990.

Adrian, M.J. and J.M. Cooper. Biomechanics of Human Movement. Benchmark Press, Indianapolis, 1989.

Winter, D. Biomechanics of Human Movement. John Wiley & Sons, New York, 1979.

4. Course Requirements and Grading Structure

Students will be responsible for laboratory write-ups and assigned readings.

Laboratory Write-Ups	50%
Midterm examination	20%
Final examination	30%

SCHOOL OF KINESIOLOGY

Library Resources for New Courses

Course number and name: KIN 301 Biomechanics Laboratory

Are the current SFU library resources adequate for this course? YES

What additional library resources are essential for the offering of this course?

None

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price

2. Journals - give title and library subscription price, if known

Faculty members making course proposal: Dr. A.E. Chapman
Dr. T.E. Milner
Mr. A.J. Leyland

Signature: for **Dr. A.E. Chapman** **Date:**

COURSE ALTERATION AND RATIONALE

SCHOOL OF KINESIOLOGY

FROM: Mechanical Properties of Tissues KIN 402-4

TO: Mechanical Properties of Tissues KIN 402-3

RATIONALE:

KIN 402 as it exists includes a laboratory component of only 6 laboratories. The new course proposal for KIN 201 and the alteration of KIN 401 into KIN 301 will result in some of these laboratories being moved to KIN 301. Many of the concepts presented in KIN 402 can be demonstrated with computer modeling, and assignments will be set in which the students will use computer models of human tissues to learn about their properties. These computer models, along with the transfer of existing labs to KIN 401 will eliminate the need for a laboratory component in KIN 402. This proposal therefore is to change KIN 402 to a lecture and tutorial course and subsequently change its associated vector.

These proposals will be more cost effective as no laboratory T.A. will be required for KIN 402, while KIN 301 will become more efficient as a full slate of 12 laboratories will be developed.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. CALENDAR INFORMATION **DEPARTMENT:** KINESIOLOGY

Abbreviation Code: KIN **Course #:** 402 **Credit hrs:** 3 **Vector** 2-1-0

Title of Course: Mechanical Properties of Tissues

Calendar description of course:

A study of the mechanical behaviour of tissues in the body and relation of this behaviour to their structure and function. The course is designed to fill the gap between anatomical (micro and macro) structure and physiological function, with a view to assessing the effects of unusual conditions (including exercise) upon behaviour of tissues.

Nature of Course: The course will consist of two hours of lecture and one hour of tutorial per week.

Prerequisites: KIN 301

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which course will first be offered? Spring 1995.

Which of your present faculty would be available to make the proposed offering possible?

Dr. A.E. Chapman

3. Objectives of the Course

This course is designed to study the biomechanical behaviour of the following tissues; muscle, bone, ligament, tendon, and cartilage. Also studied is lubrication, stability and wear in joints. A modeling approach is taken using both phenomenological and rheological models. The underlying theme is how the mechanical characteristics of tissues contribute to the determination of patterns of human movement.

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty	none
Staff	none
Library	none
Audio Visual	none
Space	none
Equipment	none. The computer model presently used was developed in-house and has been transfered into Macintosh format.. KIN 402 students can use the university Macintosh assignment lab for their assignments. Other computer models may be purchased or developed at a later date, but no immediate funding is required for this course.

5. Approval KIN 402

Date: 19 OCT 1993 Oct. 21, 1993.

Director Kinesiology	Dean Applied Science	Chairman SCUS

SCHOOL OF KINESIOLOGY

Library Resources for New Courses

Course number and name: KIN 402 Mechanical Properties of Tissues

Are the current SFU library resources adequate for this course? YES

What additional library resources are essential for the offering of this course?

None

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price

2. Journals - give title and library subscription price, if known

Faculty members making course proposal: Dr. A.E. Chapman
Dr. T.E. Milner
Mr. A.J. Leyland

Signature: for **Dr. A.E. Chapman** **Date:**

RATIONALE FOR NEW COURSE PROPOSAL

DEPARTMENT OF KINESIOLOGY

KIN 207-3 Information Processing in Human Motor Systems

RATIONALE:

This course is part of the reorganization of the undergraduate program in Kinesiology. KIN 207 will be a required, core course in the restructured curriculum. With the addition of new faculty (Hoffer, MacKenzie, Marteniuk, Milner, Weeks) and increased expertise in the area of human motor control in the School of Kinesiology, this is both possible and desirable. The course complements other lower level, core Kinesiology courses (Kin 142, 201, 205,). KIN 207 will be a useful introduction for subsequent study of: human information processing in motor learning and performance (Kin 367 and 467); systems control of movement (Kin 415 and 442); and human factors/ergonomics (Kin 280 and subsequent courses in this new stream). The course is intended to provide students with an introduction to basic concepts in human motor systems and human motor control. The course will include psychological, physiological and computational approaches to understanding voluntary, goal-directed human movement from a behavioural perspective. An introduction will be provided to basic activity systems, including locomotion, communication through speech and gesture, and manipulation. The course may be of interest to students in other units in the Faculty of Applied Science and in other Faculties at SFU. The first offering of the course is planned for the Fall of 1994.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department:** Kinesiology

Abbreviation Code: KIN **Course #:** 207 **Credit Hrs:** 3 **Vector:** 3-1-0

Title of Course: Information Processing in Human Motor Systems

Calendar Description of Course: Students are introduced to human motor systems from psychological, physiological and computational approaches. We consider voluntary goal-directed movements, primarily from a behavioural perspective, and the motor systems underlying locomotion, communication (speech, gesture, drawing, writing), emotional expression, grasping and manipulation. (Lecture)

Nature of Course: Required core course. Three, one hour lectures per week. One tutorial per week.

Prerequisites (or special instructions): Kin 142 OR by permission of instructor.

What course (courses), if any, is being dropped from the calendar if this course is approved: none

2. **Scheduling**

How frequently will the course be offered? once or twice per year

Semester in which the course will first be offered? Fall, 1994

Which of your present faculty would be available to make the proposed offering possible?
In addition to Dr. MacKenzie, Drs. Dickinson, Goodman, Marteniuk, and Weeks could teach this course.

3. **Objectives of the Course:**
1) To provide introductory knowledge of human motor systems and human motor control in kinesiology.
2) To provide a framework for subsequent studies of human factors, human information processing, human performance and human motor control systems.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:
Faculty: none
Staff: none
Library: copy of the course text
Audio Visual: none
Space: none
Equipment: none

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5. **Approval**

Date: 19 Oct 1993 Oct. 21, 1993

(Department Chair) (Dean) (Chair, SCUS)

Kin 207- 3
Information Processing in Human Motor Systems

Professor: Dr. Christine MacKenzie **Office:** K9626 **Phone:** 291-3004

Course Overview:
This course provides an introduction to basic concepts in the motor systems underlying goal directed human movement. Problems of planning and control of goal-directed movements are considered, from psychological, physiological and computational perspectives. Voluntary, automatic and uncontrolled movements are contrasted. Considered are motor systems underlying posture, locomotion, communication and manipulation. Upon completion of the course, the student should have an understanding of basic concepts, approaches and problems in human motor systems.

Topics to be covered:
1. Human Movement - Plan for this course
2. Human Motor Systems
   a) A Systems Approach
   b) Information and Information Processing
   c) Levels of Analysis (in space and time)
   d) Levels of Constraints
   e) The CNS as Controller
      i) The Conceptual Nervous System
      ii) The Central Nervous System
      iii) The Computational Neuronal System
3. Tasks and Activity Systems
   a) Tasks, Motivations, Plans and Programs
   b) Posture and Stability
   c) Locomotion
   d) Communication - Speech, gesture, writing, drawing
   e) Expression
   f) Grasping and Manipulation
4. Recurring Themes and Future Directions

Student evaluation:

Midterm 1	25
Midterm 2	25
Final Exam	50
Total	100

Course Text:
Rosenbaum, D.A. (1991). *Human motor control.* New York: Academic Press.

School of Kinesiology

Library Resources for New Courses

Course number and name: Kinesiology 207

Are the current SFU library resources adequate for this course?

yes - see course text below

What additional library resources are essential for the offering of this course?

The course text:
Rosenbaum, D.A. (1991). *Human motor control.* New York: Academic Press.

What additional library resources, if any, would be desirable but not essential for the offering of this course?

none

Faculty member making course proposal: Dr. Christine MacKenzie

Signature: CMacKenzie Date: September 20, 1993

Rationale for a New Course Proposal

Dept.: Kinesiology

Course: Molecular and Cellular Cardiology
Kin 412 (3hrs) 2-1-0

Rationale: This course has been taught two times previously. Based on the student evaluations, the course has been received enthusiastically. The content of this course builds on what is learned in Kinesiology 305 but it also attempts to integrate what has been learned in a variety of lower level courses in several disciplines. There is considerable effort in discussing both the theoretic aspects of the field as well as some applications of this knowledge. It may draw from students both from the streams of Health and Physiological Sciences and Active Health in the School of Kinesiology as well as students from other departments.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: KINESIOLOGY

Abbreviation Code: KIN Course Number: 412 Credit Hours: 3 Vector: 2-1-0

Title of Course: MOLECULAR AND CELLULAR CARDIOLOGY

Calendar Description of Course:
This course entails a detailed analysis of the molecular and cellular basis of cardiac function. The material will be derived from myriad disciplines including: Anatomy (Histology & Ultrastructure), Biomechanics, Physiology, Electrophysiology, Biochemistry and Molecular Biology. A particular emphasis will be placed on the mechanisms by which the heart responds to stresses such as Ischemia and Exercise.

Nature of Course

Prerequisites (or special instructions):
KINESIOLOGY 305

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. Scheduling

How frequently will the course be offered? 1 x p.a.

Semester in which the course will first be offered? 95-1

Which of your present faculty would be available to make the proposed offering possible? G.F. Tibbits

3. Objectives of the Course

To learn to integrate information from a variety of disciplines.
To learn to critically evaluate the literature in the area.
To learn to present scientific controversies.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty	Nil
Staff	Nil
Library	Existing serials adequate
Audio Visual	Nil
Space	Nil
Equipment	Nil

5. Approval

Date: 19 Oct 1993	Oct. 21, 1993	
Department Chairman	Dean	Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. 57

School of Kinesiology

Library Resources for New Courses

Course number and name: Kinesiology 412

Are the current SFU library resources adequate for this course?
(YES) NO

What additional library resources are essential for the offering of this course? NONE

1. **Textbooks** - give title, authors, publisher, ISBN #, price
(all books currently in library)

Physiology of the Heart, A.M. Katz. Raven Press. ISBN 0-88167-838-4

Excitation-contraction coupling and cardiac contractile force. D.M. Bers, Kluwer Academic Publishers. ISBN 0-7923-1186-8.

Heart and Cardiovascular System, 2nd. Edition. H.A. Fozzard, Raven Press.

2. **Journals** - give title and library subscription price, if known

American Journal of Physiology
Journal of Molecular Cellular Cardiology
Circulation research

The library currently subscribes to these three journals.

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known

Faculty member making course proposal:
G.F. Tibbits
Signature: _____ Date: 19 Sept. 93

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Kinesiology 412
Molecular and Cellular Cardiology

Instructor: G. F. Tibbits
Office: K9630

T.A.:

OVERVIEW

The course presents a detailed analysis of the scientific basis of cardiac function. The material will be derived from a variety of disciplines including anatomy (histology and ultrastructure), biomechanics, physiology, electrophysiology, biochemistry and molecular biology. A particular emphasis will be placed on the mechanisms by which the heart responds to stressors such as ischemia and exercise. Course structure: two hours of lecture and one hour tutorial per week.

PREREQUISITES

Kinesiology 305

TEXT

Required:
Physiology of the Heart
A.M. Katz, Raven Press (1992)

Recommended (will be on reserve in library):
Excitation-contraction coupling and cardiac contractile force
D.M. Bers, Kluwer Scientific Press (1991)

GRADING

Debate	20%
Paper	20%
Midterm	20%
Final	40%

BRIEF COURSE OUTLINE

- Cardiac Structure
  - Anatomy, Histology and Ultrastructure
- Cardiac Excitation
  - Electrophysiology and EKG
- Cardiac Contraction
  - Excitation-contraction coupling
  - Biomechanics of cardiac contraction
- Cardiac Metabolism
- Regulation of Cardiac Output
- Response to Stressors
  - Atherosclerosis
  - Ischemia
  - Exercise
- Cardiac Hypertrophy

RATIONALE FOR NEW COURSE PROPOSAL

DEPARTMENT OF Kinesiology

XXXX 000-0 Electrophysiological Techniques Lab 418 4 credits

RATIONALE:

Indicate the major reasons for the addition or alteration of the course. These might include: changes in faculty; expansion of areas of study within the department; support to joint programs or cognate departments, etc.

At the present time members of the School of Kinesiology are applying a great deal of effort to improving our undergraduate program. As part of my commitment I have developed an upper level laboratory course on the electrophysiology of excitable tissues. This course will build on our school's strength in the physiology of muscle, heart and brain and will prepare students for careers in the research, science, health and technical professions.

The course emphasizes problem solving, experimental manipulation, and critical data interpretation in an open laboratory environment. Students will have extended lab access to complete their assignments and to carry out simple curiosity driven work on their own. The results of each assignment, as well as any additional findings, will be presented to the rest of the group in an informal lab discussion held at the beginning of each session. Students will maintain both a data log and an analysis book. This large format book will document the objectives, experimental results, data analysis and critical interpretation of each session's work in an informal and conceptual manner. This approach encourages student to think about their results and to explore new ideas without the constraints of a formal lab report. The analysis book will be used as visual material during the regular oral presentations and will form an annotated record of the students progress throughout the course.

The motivation for this course is based on the need to offer our students practical, hands on experiences in research to compliment the theoretical and conceptual material delivered in lectures. The university system is under increasing pressure to provide students with an education relevant to their future careers. At present, students interested in professional careers in university based research, hospital based laboratory and diagnostic services, physiotherapy, nursing or medicine must attend or take transfer courses from other Canadian or American universities in order to develop the skills taught in this course. This is a major frustration voiced by many of my K306, directed studies, and special topics students. These students make it clear that they strongly support the mounting of upper levels laboratory courses designed to enhance practical laboratory skills or to expose them to realistic research environments.

A second motivation for this course is based on the benefits of enhancing our academic ties with Engineering Sciences. Over the last 2 years I have chaired the Biomedical Engineering Curriculum Committee in the School of Engineering Sciences. The end result is that the biomedical engineering stream is now a combined Bachelor/Masters program. Both the engineering faculty and students view Kinesiology as their major source of non-engineering expertise and are highly motivated to develop joint courses at both the graduate and undergraduate level. This interest spans all of the disciplines of Kinesiology but the interface between electronics and excitable tissues is a key issue. In response to this need for

increased ties between our two schools I have frequently included biomedical engineering students in my courses. The result of this cross fertilization is a greatly enhanced learning environment for both Kinesiology and Engineering students since these groups have different, yet very complimentary, perspectives on biology, electrical theory and the approach to research.

A pilot of this course took place in the summer of 1992 with the financial support of the School of Engineering. The students were drawn from Kinesiology, Engineering and Biology. The course was highly successful as indicated by the attached comments from several of the students. The students made clear progress in their technical, communication, record keeping, and data analysis skills and came away from the course with an intimate knowledge of the neuron and its role in brain function. This result is strong justification for continuing to offer this course to our students.

At the present time Biosciences is altering BISC 405 to increase the emphasis on neurophysiology. Dr. K. Delaney, the course supervisor has reviewed the course outline and objectives of K418 and agrees that academic overlap of K418 and the Biosciences course is small. His course is a comparative approach to the integrative function of the nervous system with a particular emphasis on synaptic function where as K418 will use a single model system to focus on general research methods in the neurosciences.

The course will accept between 12 and 16 students. Based on the Kinesiology undergraduate program survey taken in the summer of 1993 the majority of students feel that physiology is an important component of Kinesiology at SFU and over 50% of our students are considering further training in professional schools in the medical field. Many of these students contact me directly to voice their desire for an upper levels laboratory course in the neurosciences. It is clear by the number of enquiries that we will fill the available positions in the course on a regular basis.

Please note: a new course proposal form, course outline, and reading list must accompany any new course/program proposal - see Appendix B for an example.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department** Kinesiology
Abbreviation Code: **Course #:** KIN418 **Credit Hrs:** 4 **Vector:** 2-0-5
Title of Course: Electrophysiological Techniques Lab
Calendar Description of Course:

This laboratory course allows students to explore basic biophysical and electrophysiological properties of excitable tissues in a realistic research environment and to develop practical laboratory skills for the neurosciences.

Nature of Course: Electrophysiology Laboratory

Prerequisites (or special instructions): required KIN306, recommended K415

What course (courses), if any, is being dropped from the calendar if this course is approved: none

2. **Scheduling**

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? Inter or summer semester

Which of your present faculty would be available to make the proposed offering possible? Dr. Tom Richardson

3. **Objectives of the Course:**

The objective of this laboratory course is to allow students to explore basic biophysical and electrophysiological properties of excitable tissues in a realistic research environment and to develop practical laboratory skills for the neurosciences.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:

Faculty: The only faculty required will be Dr. Tom Richardson the course instructor.

Teaching Assistance: A teaching assistant skilled in the area will be required.

Equipment: The pilot took place in the instructors research laboratory using the instructors equipment. In the future the course will share equipment available through BISC 305 and 405. All of the basic equipment for four basic setups is presently available. This will accommodate from 12 to 14 students. Please see the letter from Dr. Delaney.

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5. **Approval**

Date: 21 Oct 1993 Oct. 21, 1993

(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(*When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline).* Arts 92-3 (* **note: a separate library report is now required)**

To: The Undergraduate Curriculum Committee

From: Dr. K. Delaney, Biosciences

Date: Oct 19, 1993

Re: KIN 418 course proposal

Dear Members,

This letter is to confirm that at least four basic electrophysiological recording setups are presently functional and available for Dr. Richardson's proposed course. These setups will be free for use by KIN 418 each summer as well as other times during the year. These setups will support between 12 and 16 students.

The equipment was purchased in order to enhance BISC 305 (comparative physiology) and 405 (cell physiology). At the present time I am altering BISC 405 to increase the emphasis on neurophysiology. This course will have some common elements with the course proposed by Dr. Richardson. However, it is a comparative approach to the integrative function of the nervous system where as KIN 418 will use a single system to concentrate on general research methods in the neurosciences.

I have had an enthusiastic response to the neurophysiological emphasis of BISC 405 and have no trouble filling all the available places in the course. I expect that KIN 418 will be accepted by the students with equal enthusiasm. I believe these two courses are highly synergistic and I strongly support the acceptance of KIN 418.

Sincerely

Kerry Delaney

Dr. K. Delaney

COURSE OUTLINE/READING LIST

ELECTROPHYSIOLOGICAL TECHNIQUES LAB K418
INSTRUCTOR - Dr. Tom Richardson

The objective of this laboratory course is to allow students to explore basic biophysical and electrophysiological properties of excitable tissues in a realistic research environment and to develop practical laboratory skills for the neurosciences. The course teaches the basics of both intra and extracellular recording techniques through experiments demonstrating the physiology of the membrane potential, synaptic and non-synaptic interactions, simple motor and sensory reflexes, as well as various forms of potentiation and inhibition within small networks of neurons.

Small groups of students will work as a team on an electrophysiological "set up". Each experimental assignment is designed to exercise the students ability to plan and execute many of the routine tasks involved in measuring the properties of excitable tissues. During the first half of the course students will develop fundamental skills working on the isolated ganglion preparation of the medical leech, hirudo medicinalis. These ganglia have a very simple organization and large, easily penetrated neurons. After students are familiar with the basics they will have the opportunity to apply their new skills in assignments using the slice preparation of the rat hippocampus.

Each day in the lab will consist of:

1) a one hour pre-lab demonstration and lecture introducing the relevant physiological principles and practical techniques necessary for the session.

2) a one hour group discussion of the previous lab's results. During this session each student will present their own data to the rest of the group in a semiformal manner. The instructor will use this time to foster a general discussion focused on the fundamentals of the physiology as well as the practical aspects of laboratory research.

3) an open ended laboratory session where the students carry out electrophysiological recordings and data analysis using modern laboratory equipment (in the instructors lab).

By the end of the course each student will have recorded the electrical activity of living neurons under a variety of conditions and will be competent with using standard intracellular and extracellular methods. They will be familiar with common laboratory equipment including pre-amplifiers, filters, stimulation units, micromanipulators, glass micropipettes, as well as output devices such as oscilloscopes, chart recorders, and other modern data acquisition devices. Of equal importance, they will have a working knowledge of several key electrophysiological concepts.

This course will expose students to a simulated research environment where they will have the opportunity to experience, first hand, many of the important activities involved in the study of excitable tissues. Through this process they will also develop a better understanding of the process of scientific investigation relevant to careers in hospital laboratories, university research, biomedical engineering, physiotherapy and the medical professions.

GRADING
Laboratory progress/Seminar participation 50%
Practical laboratory final 50%

COURSE SCHEDULE

WK1 Equipment assembly and operation
Using a capacitor/resistor model of a cell test set-up
Measure input resistance, electrode resistance, rmp

WK2 Make and test glass micropipettes in Ringers
Study ganglion preparation/anatomy
Make first intracellular recording
Measure membrane time constant, RMP, input resist, etc.

WK3 Construct a map of ganglion
Characterize action potentials of cell types

WK4 Examine electrical coupling between cells
Conduct collision experiment

WK5 Examine chemical synapses
Lucifer yellow injection to study neuronal anatomy

WK6 Sensory/motor pathways using isolated skin/ganglion
Stimulate skin, record from sensory neurons
Stimulate motor neurons, record skin responses

WK7 Open lab review
Introduction to hippocampal anatomy

WK8 The population response
Hippocampal slice recording
Orthodromic stimulation
Extra-cellular CA1 vs dentate gyrus

WK9 TMP
Intra-cellular/extra-cellular recording in the slice
Anti-dromic stimulation

WK10 Extra-somatic field potentials
Effect of ephaptic interactions on population responses

WK11 Preparation session
Set-up hippocampal slice chamber, solutions, tissue

WK12 Open lab review

WK13 Lab final

School of Kinesiology

Library Resources for New Courses

Course number and name: K418 Electrophysiology Techniques Lab

Are the current SFU library resources adequate for this course?
YES

What additional library resources are essential for the offering of this course?

1. Textbooks the following books are already in the library

Principles of Neural Science by Kandel, Schwartz and Jessell
Synaptic Organization of the Brain by Shepherd
From Neuron to Brain by Kuffler, Nicholls and Martin

2. Journals - The following journals are already in our library

Brain Research
Journal of Neurophysiology

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known

NONE

Faculty member making course proposal: Dr. Tom Richardson

Signature: _____ Date: Sept 20, 93

KINESIOLOGY STREAM IN HUMAN FACTORS/ERGONOMICS

The field of Human Factors/Ergonomics has shown considerable expansion over the last 10 years. There has not been a commensurate increase in the training of Human Factors/Ergonomics specialists. In fact, there is no formal training at the B.Sc level in Western Canada in this area. The National Research Council estimates that the demand for human factors specialists will exceed the supply "well into the 1990s."

The proposed program is based in the School of Kinesiology. This is a logical choice since many existing core courses in Kinesiology form the basis for study in this applied field. Secondly, a new faculty member with expertise in Human Factors/Ergonomics was recently hired and other members of the School have either principal or secondary research interests in this area. There is also a precedent for housing Human Factors/Ergonomics in Kinesiology. Such a program has been recently introduced at Waterloo.

The new program will make some demands in terms of resources. While one course directly in this field (Kin 480) will be dropped and its equipment become available, new courses will require additional funds. Application will be made for funds available for new initiatives. In addition, because of its prerequisite structure, the courses will be phased in over a three year period, enabling equipment purchase to be spread over a number of fiscal years.

Instructors for the new courses have been identified and courses can be offered without increase in faculty. This has been accomplished by a combination of the following strategies. New faculty hired in the past two years were selected with this program in mind. One course will be dropped. Other courses will be re-scheduled to a less frequent campus offering, where correspondence versions of the course ensure that students will not have reduced access.

The enclosed program is incomplete. In subsequent years new course proposals will be forthcoming. Currently the program lacks a course in work physiology. A revision of physiology offerings is underway in Kinesiology in which issues of overlap and application are being addressed. This may result, for example, in a new course being proposed which combines material from the fields of exercise and work physiology (exercise physiology exists already as a course). In addition, courses in activity related musculo-skeletal disorders, thermal physiology and a laboratory course are planned and will be proposed when resources for these courses can be assured.

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

KINESIOLOGY 280-3
INTRODUCTION TO HUMAN FACTORS/ERGONOMICS

RATIONALE:

This course forms part of the reorganization of the undergraduate program in Kinesiology. KIN 280 will be a required course in the undergraduate **Human Factors/Ergonomics** stream of Kinesiology and will be relevant to students in other units of the Faculty of Applied Sciences as well as the Faculty of Arts. An overview of human capabilities, limitations, characteristics, behaviour, motivation, as well as environmental characteristics is essential to promote a *systems approach* to the design of things, procedures people use, and the environment in which they use them. The overall objective is to provide students a background from which to delve into more specialized upper-level courses in the human factors/ergonomics stream. As well, the course will be relevant to students in other units of the FAS, Psychology, and Business Adminstration.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department:** Kinesiology

Abbreviation Code: KIN **Course #:** 280 **Credit Hrs:** 3 **Vector:** 2-1-0

Title of Course: Introduction to Human Factors/Ergonomics

Calendar Description of Course: This course deals with the field of Human Factors. Human Factors refers to designing for human use. The approach of the course is to present a systematic application of relevant information about human capabilities, limitations, characteristics, behaviour, and motivation to the design of things, procedures people use, and the environment in which they use them.

Nature of Course: Two, one hour lectures each week. One hour laboratory or tutorial session each week.

Prerequisites (or special instructions): KIN 142, 201, 207, or permission of the instructor

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. **Scheduling**

How frequently will the course be offered? Once per year, fall semester

Semester in which the course will first be offered? 94-3

Which of your present faculty would be available to make the proposed offering possible? D. Weeks is available to offer this course. As well, C. MacKenzie, D. Goodman, R. Marteniuk, J. Morrison would be capable of offering this course.

3. **Objectives of the Course:** Students will study aspects of information input, human output and control, workplace design, environmental conditions, as well as some selected human factors applications. Emphasis will be placed on the empirical research basis of human factors by stressing basic concepts and the human factors considerations involved in the topics covered. The overall objective is to provide students a background from which to delve into more specialized upper-level courses in the human factors/ergonomics stream.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:
Faculty: None
Staff: None
Library: see attachment
Audio Visual: None
Space: Use of existing laboratory space in Kinesiology/ Academic Computing Services labs will be booked
Equipment: some software packages may be required ($2000 - $5000)

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5. **Approval**

Date:	19 Oct 1993	Oct. 21, 1993	
	(Department Chair)	(Dean)	(Chair, SCUS)

School of Kinesiology

Library Resources for New Courses

Course number and name: KIN 280 - Introduction to Human Factors Engineering

Are the current SFU library resources adequate for this course?

YES X NO

What additional library resources are essential for the offering of this course?

1. **Textbooks** - give title, authors, publisher, ISBN #, price

The books currently available in the library are attached. This list appears to be sufficient to offer this course

2. **Journals** - give title and library subscription price, if known

Necessary journals are presently held in the library and are sufficient, assuming that they are not cut due to funding.

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known

Faculty member making course proposal: D. J. Weeks
Signature: _____ Date: Oct 4/93

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

KINESIOLOGY 380-3: OCCUPATIONAL BIOMECHANICS

RATIONALE:

This course forms part of a reorganization of the undergraduate program in Kinesiology. The existing upper levels required course in Biomechanics (KIN 401) is being replaced by a more introductory lower levels equivalent course (KIN 201). This provides more flexibility for specialist courses and more advanced study in Biomechanics at the upper levels, and forms a bridge between 1st year Math's and Physics and upper levels biomechanics courses. KIN 380 will be a required course in the undergraduate "Ergonomics" stream of Kinesiology. Biomechanics is a fundamental component of Ergonomics education and practice, and is essential to the effective offering of this program within Kinesiology.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** Department: Kinesiology

Abbreviation Code: KIN **Course #:** 380 **Credit Hrs:** 3 **Vector:** 3 - 0 - 0

Title of Course: Occupational Biomechanics

Calendar Description of Course: This course will teach the principles of biomechanical analysis and their application in the workplace. Topics will include techniques for measurement and analysis of movement; analysis of forces and accelerations in three dimensions; work and power; simple biomechanical and biodynamic models; standards for lifting and carrying - their application and limitations.

Nature of Course: Three one hour lectures each week.

Prerequisites (or special instructions): KIN 201, KIN 205, and KIN 326 which may be taken concurrently.

What course (courses), if any, is being dropped from the calendar if this course is approved: KIN 480 - Human Factors in the Working Environment

2. **Scheduling**

How frequently will the course be offered? Once per year, fall semester
Semester in which the course will first be offered? 94-3

Which of your present faculty would be available to make the proposed offering possible J. Morrison

3. **Objectives of the Course:** This course will teach students how to apply the principles of biomechanical analysis to common work tasks. The course will draw upon the knowledge base aquired in KIN 201, and further extend the concepts and principles learned in that course. Students will learn techniques used to measure movement, and to analyze forces, work and power, and their application and limitations when applied in an industrial setting. Course material will include the construction of simple biomechanical models, existing standards for lifting and carrying, and recognition of their limitations.

Occupational biomechanics comprises one unit in KIN 480 ("Human Factors in the Working Environment"), which will be dropped from the Calendar. The occupational biomechanics material will be substantially expanded.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:

Faculty	None
Staff	None
Library*	Chaffin DS, Andersson GBJ. Occupational Biomechanics, Second Edition. N.Y.: John Wiley + Sons, 1991.
Audio Visual	None
Space	None
Equipment	None

5. **Approval**

Date: 21 Oct 1993	Oct. 21, 1993	
(Department Chair)	(Dean)	(Chair, SCUS)

School of Kinesiology

Library Resources for New Courses

Course number and name: KIN 380 - Occupational Biomechanics

Are the current SFU library resources adequate for this course?
YES NO X

What additional library resources are essential for the offering of this course?

1. **Textbooks** - give title, authors, publisher, ISBN #, price

a) Chaffin D. B., Andersson G. B. J. Occupational Biomechanics. 2nd Edition, N. Y. John Wiley + Sons, 1991 (2 copies)

b) Mital, A., Nicholson, A.S., and Ayoub, M.M. A Guide to Manual Materials Handling. Taylor Francis, London(U.K.) and Washington (D.C.). ISBN: 0-85066-801-8

2. **Journals** - give title and library subscription price, if known

Ergonomics: Taylor Francis, London
Journal of Biomechanics
Both of these journals are presently held in the Library but could be cut due to funding.

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known

Faculty member making course proposal: J. B. Morrison

Signature: R C Andersson for J.B. Morrison Date: Oct 4/93

RATIONALE FOR NEW COURSE PROPOSAL

SCHOOL OF KINESIOLOGY

KINESIOLOGY 382-3: PHYSICAL HAZARDS IN THE WORKPLACE

RATIONALE:

Indicate the major reasons for the addition or alteration of the course. These might include: changes in faculty; expansion of areas of study within the department; support to joint programs or cognate departments, etc.

This course forms part of the reorganization of the undergraduate program in Kinesiology. The existing upper levels course KIN 480 - Human Factors in the Working Environment, is being dropped. The material contained in KIN 382 has been taught in KIN 480, but as this was the only course in Human Factors/Ergonomics, it was not possible to include all subjects in each offering of the course, and the topics covered varied from year to year. Some of the topics covered in KIN 480 have been moved to KIN 380 and the remaining material will be covered in KIN 382. KIN 382 will be a required course in the undergraduate "Ergonomics" stream of Kinesiology. An understanding of the physical aspects of the working environment and their interaction with health, safety and performance is essential in order to develop a "systems" approach to work place evaluation, modification , and ergonomic design.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information — Department: Kinesiology

Abbreviation Code: KIN **Course #:** 382 **Credit Hrs:** 3 **Vector:** 2 - 0 - 2

Title of Course: Physical Hazards in the Workplace

Calendar Description of Course: The focus of this course will be the study of the physical environment and its effects on the health, safety and performance of the worker.. Physical problems associated with noise, vibration, lighting, radiation dust and ventilation will be examined together with methods of recognition, treatment, protection and prevention.

Nature of Course: Two, one hour lectures each week. One, two hour laboratory session each week.

Prerequisites (or special instructions): KIN 142, PHYS 130 or 131, KIN 201, KIN 205, KIN 280. Students with credit for KIN 480 may not take KIN 382 for further credit.

What course (courses), if any, is being dropped from the calendar if this course is approved: KIN 480 - Human Factors in the Working Environment

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? After 94-3

Which of your present faculty would be available to make the proposed offering possible? J. Morrison, E. Banister, S. Brown

3. Objectives of the Course: Students will study physical aspects of the environment and their effects on health, safety, comfort and performance. Emphasis will be placed on the relationship between physical measures (of sound, vibration, light, etc.) and physiological response (in terms of acute and chronic health effects). Students will learn instrumentation, measurement techniques, interpretation of data, dose-response relationships, and industrial standards for human exposure to environmental factors.

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty	None
Staff	None
Library	Refer to attached library report form
Audio Visual	None
Space	Use of existing teaching laboratory space in Kinesiology.
Equipment	Please refer to attached explanation.

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5. Approval

Date: 21 Oct 1993	Oct. 21, 1993	
(Department Chair)	(Dean)	(Chair, SCUS)

KIN 382 "Physical Hazards in the Workplace"

Proposed Laboratories

prepared by Stephen Brown and Jim Morrison, October 12, 1993

Course format

Two, one-hour lectures and one two-hour lab each week.
Course offered once/year.
Course scheduled with three laboratory groups, with up to 10 students per group.

Course pre-requisites

KIN 142, PHYS 130 or 131, KIN 201, KIN 205

Grading

50% exams, 50% assignments/lab reports. There will be no project in this course; projects will be done in KIN 487 ("Project Lab in Human Factors/Ergonomics").

Purpose of the labs

- reinforce the concepts presented in lecture
- introduce students to equipment, measurement techniques, and exposure guidelines/limits
- develop ability at scientific and technical report writing

Proposed labs

Noise

Lab 1	Area and grid sampling
Lab 2	Dosimetry
Lab 3	Audiometry (measurement of hearing threshold levels)

Vibration

Lab 4	Hand-arm vibration
Lab 5	Whole body vibration

Light

Lab 6	Light measurement
Lab 7	Measurement of vision (Snellen chart, colour-blindness, dark adapatation)

Radiation

Site visit to Laser Lab in Engineering Sciences
Site visit to "Hot Lab" in Biosciences

Ventilation

Lab 8 Measure air flow rates and temperature control in Man/Machine Lab

Equipment needs (cost in $ Can)

Develop a generic data collection and processing system (e.g., laptop PC-compatible computer with A/D board and LabTech Notebook and DADISP software), and use a range of transducers (e.g., noise level meter, accelerometer, light meter) whose analogue output is directed to the computer. This will be less expensive than a number of systems each dedicated to measuring just one variable.

Year 1

Use existing resources to develop and test labs:

- Dr. Morrison's research equipment:
  - PC-compatible laptop computer (Zenith 8086 + extension chasis) (1)
  - Lab Tech Notebook (1)
  - DADISP (1)
  - A/D board (1)
  - accelerometers (3)
- KIN 480 equipment
  - Sound level meters (2 with frequency analyzer module, 4 without)
  - B+K hand/arm vibration meter (1)
  - Litemate/Spotmate light meters (2)
- KIN 407 equipment
  - Zenith 286 PC-compatible computers (3)
  - A/D boards (3)
  - Lab Tech Notebook (3)
  - DADISP (3)

Purchase:

- HV Lab software for processing vibration signals; cost $1,500 (1)

Year 2, purchase (at cost of $10,900):

- laptop-computer; $4,200 for Zenith 80486SX (or $3,700 for 80386SL with lower processing speed). Lap-tops are specified as the

students will use them to collect noise and vibration data at various industrial sites off-campus

- 2 accelerometers; @ $900 = $1,800
- seat pan with triaxial accelerometer for recording whole-body vibration; $2,500
- 6 amplifiers for transducers; @ $300 = $1,800
- A/D board with higher sampling rate than those used in KIN 407; $600

The three computers and A/D boards used by KIN 407 (see above) and, to a lesser extent, by KIN 203, 401, 480 and 485 are dated. Limited RAM makes it impossible to run the newer, larger programs and to display in real-time data sampled at high sampling rates (e.g., 1 KHz). Slow processing speed delays large computations (such as curve fitting/smoothing and frequency spectral analysis). Old A/D boards limit data collection to two channels at 1 KHz, the minimum sampling rate needed to faithfully record signals such as electrical activity from muscles. The old computers have served our courses well, but need to be upgraded. The computers and A/D boards which we plan to purchase for KIN 382 will be available for our other undergraduate laboratory courses, and will meet the need for the upgrade.

Year 3, purchase (at cost of $10,900):

- two more laptop-computers; @ $4,200 = $8,400
- two more A/D boards like the one purchased in Year 2; @ $600 = $1,200
- Gravis sound card. This device fits into a slot in the mother board of the computer. $300
- Digital sound system to use with Gravis sound card and computer; $1,000. Sounds collected in the field, or simulations of sounds, are stored in digital form on a floppy disk by a lap-top computer. The sounds may later be played back in the lab on the sound system. This allows the students to measure noises in the lab, perform frequency spectral analysis of sounds, and study the effects of addition of noises and cancellation of sound pressure waves due to reflections. It is not practical to borrow a sound system from IMC for this purpose, because the system will need to be hardwired and programmed to get the sound levels produced in the lab to reproduce the sound levels measured in the field. The system will remain set up in the lab for the semester, students will book time, and work with the system in pairs.

School of Kinesiology

Library Resources for New Courses

Course number and name: KIN 382 - Physical Hazards in the Workplace.

Are the current SFU library resources adequate for this course?

YES NO **X**

What additional library resources are essential for the offering of this course?

1. **Textbooks** - give title, authors, publisher, ISBN #, price

a) Work Design: Industrial Ergonomics, Stephen Konz, 2nd Ed. T 60.8 K66, 1983 (2nd Copy for reserve).

b) Evaluation of Human Work. J. R. Wilson, and E.N. Corlett Taylor Francis Ltd. LT59.7 E93, 1990 (2nd copy).

c) The Worker At Work. T. M. Fraser Taylor Francis Ltd. HG 7261 F 72, 1989 (2nd copy for reserve).

2. **Journals** - give title and library subscription price, if known

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known
   - *International Journal of Industrial Ergonomics. Elsevier Science Publishers: North Holland. ISSN: 0169-8141.*

Faculty member making course proposal: J. B. Morrison

Signature: R C Asmundson for J.B. Morrison Date: Oct 4/93

RATIONALE FOR NEW COURSE PROPOSAL

DEPARTMENT OF KINESIOLOGY

KIN 383-3 Human-Machine and Human-Computer Interaction

RATIONALE:

This course is part of the reorganization of the undergraduate program in Kinesiology. KIN 383 is a required course in the Human Factors/Ergonomics stream in the School of Kinesiology. There are three new faculty members with interest in this area (MacKenzie, Marteniuk, Weeks) The course focuses on human-machine, and specifically, human-computer interaction. With increased growth and focus on information technology in B.C. and Canadian industry, this course will meet the needs of students with interests in the area of human factors at the interface with machine or computer. The course may be of interest to students in other units in the Faculty of Applied Science (e.g., Communications, Computing Science, Engineering Science) and in other Faculties at SFU. The course was offered by Dr. MacKenzie as Kin 421 (Selected Topics) in Spring, 1992, and Spring, 1993 semesters, and will be offered again in the Spring, 1994 semester. The first offering of KIN 383 is intended for Spring, 1995.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department:** Kinesiology

Abbreviation Code: KIN **Course #:** 383 **Credit Hrs:** 3 **Vector:** 2-1-0

Title of Course: Human-Machine and Human-Computer Interaction

Calendar Description of Course: Human information processing and motor control factors are considered as factors relevant to effective, usable human-machine interfaces. A user-centred approach deals with task analysis, context of use, information processing demands, the interface, and the design, assessment and usability of tools, machines and computers. (Lecture/Tutorial)

Nature of Course: Advanced study and project on human-machine interaction. One, two hour lecture and one hour tutorial

Prerequisites (or special instructions): At least 60 credit hours and Kin 280 OR by permission of instructor. Kin 203 or relevant computing background required.

What course (courses), if any, is being dropped from the calendar if this course is approved: none

2. **Scheduling**

How frequently will the course be offered? once per year

Semester in which the course will first be offered? Spring or Fall, 1995

Which of your present faculty would be available to make the proposed offering possible? In addition to Dr. MacKenzie, Drs. Dickinson, Marteniuk, and Weeks have expressed interest in teaching the course.

3. **Objectives of the Course:**
1) To provide knowledge of human-machine interaction.
2) To provide exposure and experience in the process of iterative design.
3) To provide independent learning opportunities.
4) To provide experience in cooperative group projects.
5) To improve seminar communication skills.

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:
Faculty: none
Staff: none
Library: none - see attached form
Audio Visual: occasional use of A-V equipment (e.g., video)
Space: none
Equipment: none

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5. **Approval**

Date: 19 Oct 1993 Oct. 21, 1993

(Department Chair) (Dean) (Chair, SCUS)

Kin 383- 3
Human-Machine and Human-Computer Interaction

Professor: Dr. Christine MacKenzie **Office:** K9626 **Phone:** 291-3004

Course Overview:

Human Factors Motto: **"Honour the user"**

In this course we examine topics in human factors relevant to human-machine and human-computer interaction. Included are the main topics of: context of usage, the human, the machine, user interfaces, and their design and evaluation. In addition to lectures and tutorials, students will select a human-machine interface problem for in-depth investigation. In the latter half of the course, students present a seminar to the group (ie., learning from one another), and submit a final, written report on the project.

Topics to be covered:

1. Plan for this course
2. Human factors and human-machine interaction - definitions, scope
3. Context of using tools, machines, computer
   a) Tasks and allocation
   b) Systems and system design
   c) Design and evaluation
4. The Human
   a) Human information processing model
   b) Models of human communication
   c) Action, motor control and modes for interaction
5. The Machine
   a) Visual, auditory and tactile displays
   b) Tools and controls
   c) Computer input and output devices
6. The Interface (a user-centred perspective)
   a) Task demands
   b) Knowledge and control
   c) Direct manipulation as a model
   d) Intelligent graphic interfaces
7. Evaluation

Student evaluation:

Participation	10
Midterm	30
Project	
Proposal	5
Detailed outline	10
Presentation	20
Final report	25
Total	100

Course Text - Required:

Shneiderman, B. (1992). Designing the user interface: Strategies for effective human-computer interaction. Second edition. New York: Addison-Wesley, Inc.

Recommended Resources:

Kantowitz, B.H. & Sorkin, R.D. (1983). Human factors: Understanding people-system relationships. New York: Wiley.

Meister, D. (1989). Conceptual aspects of human factors. Baltimore: John Hopkins University Press.

Wickens, C.D. (1992). Engineering psychology and human performance. Second edition. New York: HarperCollins Ltd.

Suggested project topics (refer also to past reports on reserve in the library):
Anthropometry and the design of workspace, Technical aids for the elderly, Shiftwork effects on human performance with specific interfaces, Visual perception of video display terminals, Effects of gloves on control operations, Attentional directors - Comparing different warning signals, Software usability, Use of simulations and/or mockups, Speech technology in human-machine interfaces, Interface design and motor vehicle accidents, Comparisons of hand activated controls, Detecting errors in complex systems from visual displays, Specialized peripheral devices for special populations.
(or pick your own, with permission of instructor)

School of Kinesiology

Library Resources for New Courses

Course number and name: Kinesiology 383

Are the current SFU library resources adequate for this course?

yes - but need course text

What additional library resources are essential for the offering of this course?

1. Course Textbook:
   Shneiderman, B. (1992). Designing the user interface: Strategies for effective human-computer interaction. Second edition. New York: Addison-Wesley, Inc..
   ISBN 0-201-57286-9

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Books:
   Proceedings of *future* conferences on Human-Computer Interaction (e.g., SIGCHI (Special Interest Group on Computer-Human Interaction) of the Association for Computing Machinery, *as they become available.*
   Proceedings of *future* symposia and conferences on human considerations in "virtual reality", *as they become available.*

2. Journals: new journals on human factors in human-computer interaction and virtual reality, *as they become available.*

Faculty member making course proposal: Dr. Christine MacKenzie

Signature: CMacKenzie Date: September 20, 1993

RATIONALE FOR NEW COURSE PROPOSAL

DEPARTMENT OF KINESIOLOGY

KINESIOLOGY 486 INDUSTRIAL DESIGN

RATIONALE:

This course forms part of the reorganization of the undergraduate program in Kinesiology. KIN 486 will be a required course in the undergraduate **Human Factors/Ergonomics** stream of Kinesiology.and will be relevant to students in other units of the FAS as well. In an industrial context, a well-designed human-machine system must have more than just good display and control components. The essence of industrial design is to arrange system components so as to minimize production inefficiencies and quality control and safety compromises. The objective of the course is to learn the rudiments of design layout. Industrial examples will be presented to illustrate how human-factors input can improve the production process and help to control some of the extreme hazards that arise in industrial environments.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. **Calendar Information** **Department:** Kinesiology

Abbreviation Code: KIN **Course #:** 486 **Credit Hrs:** 3 **Vector:** 2-1-0

Title of Course: Industrial Design

Calendar Description of Course: The objective of the course is to learn the rudiments of design layout. In an industrial context, a well-designed human-machine system must have more than just good display and control components. The essence of industrial design is to arrange system components so as to minimize production inefficiencies and quality control and safety compromises. Industrial examples will be presented to illustrate how human-factors input can improve the production process and help to control some of the extreme hazards that arise in industrial environments.

Nature of Course: Two, one hour lectures each week. One hour laboratory or tutorial session each week.

Prerequisites (or special instructions): KIN 203 or relevant computing experience, 303, 326, and 380

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. **Scheduling**

How frequently will the course be offered? Once per year, spring semester

Semester in which the course will first be offered? 95-1

Which of your present faculty would be available to make the proposed offering possible? D. Weeks. As well, Mr. Gavril Morariu (Research Engineer) and Mr. Richard Ward (Lab Instructor) may be available to help with labs.

3. **Objectives of the Course:**

Students will learn:
- how things can be designed to fit the physical dimensions of people, including displays and control, tools, workstations
- processes used in a number of major industries
- how tasks are combined into jobs, and the effects of job rotation, shift work, and work-rest schedules on performance
- the stages of the design process, and the role of different members of the design team
- how to express design ideas using CAD (Computer-Aided Design)

4. **Budgetary and Space Requirements**

What additional resources will be required in the following areas:
Faculty: None
Staff: None
Library: see attachment
Audio Visual: None
Space: Use of existing laboratory space in Kinesiology/Academic Computing Services labs will be booked
Equipment: CAD software ($1000 - $3000)

5. **Approval** Kin 486

Date:	19 Oct 1993	Oct 21, 1993	
	(Department Chair)	(Dean)	(Chair, SCUS)

School of Kinesiology

Library Resources for New Courses

Course number and name: KIN 486 - Industrial Design

Are the current SFU library resources adequate for this course?
YES X NO

What additional library resources are essential for the offering of this course?

1. **Textbooks** - give title, authors, publisher, ISBN #, price

The books currently available in the library are attached. This list appears to be sufficient to offer this course

2. **Journals** - give title and library subscription price, if known

Necessary journal are presently held in the library and are sufficient, assuming that they are not cut due to funding.

What additional library resources, if any, would be desirable but not essential for the offering of this course?

1. Textbooks - give title, authors, publisher, ISBN #, price
2. Journals - give title and library subscription price, if known

Faculty member making course proposal: D. J. Weeks
Signature: Daniel J. Weeks Date: Oct 4/93

TO: Senate Committee on Undergraduate Studies

FROM: Dr. Andy Hoffer
Director, School of Kinesiology

SUBJECT: Library Assessment of New Kinesiology Course Proposals

DATE: November 12/93

After negotiations with the Library, we have reached agreement regarding the library requirements for the new courses which we are proposing. The School of Kinesiology accepts responsibility for the costs described in the attached memo from Ralph Stanton to Craig Asmundson dated November 12, 1993 (ie) one time costs of $600 and recurring costs of $365.00. For Kinesiology 382, in order to purchase the International Journal of Industrial Ergonomics at a cost of $534 per year, we will be deleting other journals from our collection in the library.

cc: Dr. Parveen Bawa, Associate Dean, Faculty of Applied Sciences

MEMO

TO: Craig Asmundson, Undergraduate Curriculum Committee Chair, School of Kinesiology

FROM: Ralph Stanton (Library Collections Management Office)

RE: Library Assessment of New Course Proposals in Kinesiology, 14 courses beginning with KIN 201 (Addendum and FINAL REVISION)

DATE: 12 November, 1993

This memo revises the costs associated with these courses given in our assessment of 20 October, 1993. The revisions result from discussions between the School of Kinesiology and the Library which produced the following agreed costs.

KIN 201-3 Basic Biomechanics

Revised:

THE ONE TIME COST ASSOCIATED WITH THIS COURSE IS $100 (FOR ADRIAN, M.J. AND COOPER, J.M. - BIOMECHANICS OF HUMAN MOVEMENT). THE RECURRING COST ASSOCIATED WITH THIS COURSE IS $50 PER YEAR.

KIN 207-3 Information Processing in Human Motor Systems

Same

THE ONE TIME COSTS ASSOCIATED WITH THIS COURSE ARE $100. THE RECURRING COSTS ASSOCIATED WITH THIS COURSE ARE $000 PER YEAR.

KIN 221-3 Special Topics in Kinesiology

Same

THERE ARE NO COSTS ASSOCIATED WITH THIS COURSE.

KIN 280-3 Introduction to Human Factors/Ergonomics

Revised

THE ONE TIME COSTS ASSOCIATED WITH THIS COURSE ARE $000. THE RECURRING COSTS ASSOCIATED WITH THIS COURSE ARE $100 PER YEAR ADDED TO BASE.

KIN 301-3 Biomechanics Laboratory

Revised

THERE ARE NO COSTS ASSOCIATED WITH THIS COURSE.

KIN 380-3 Occupational Biomechanics

Revised

THE ONE TIME COSTS ASSOCIATED WITH THIS COURSE ARE $200 (1 COPY EACH OF MITEL AND CHAFIN). THERE ARE NO RECURRING COSTS ASSOCIATED WITH THIS COURSE.

KIN 382-3 Physical Hazards in the Workplace

Revised

THERE ARE NO ONE TIME COSTS ASSOCIATED WITH THIS COURSE. THE RECURRING COST ASSOCIATED WITH THIS COURSE IS $534 (TO PURCHASE THE INTERNATIONAL JOURNAL OF INDUSTRIAL ERGONOMICS). THE SCHOOL OF KINESIOLOGY COMMITS TO EITHER DELETING EXISTING JOURNALS OF EQUIVALENT COST FROM THEIR LIST OR TRANSFERRING THIS AMOUNT TO THE LIBRARY BASE BUDGET.

KIN 383-3 Human-Machine and Human-Computer Interaction

Same

THERE ARE NO COSTS ASSOCIATED WITH THIS COURSE.

KIN 402-3 Mechanical Properties of Tissues

Revised

THE ONE TIME COST ASSOCIATED WITH THIS COURSE IS $200 (1 COPY EACH OF ALEXANDER AND MORDANT). THERE ARE NO RECURRING COSTS ASSOCIATED WITH THIS COURSE.

KIN 412-3 Molecular and Cellular Cardiology

Revised

THERE IS NO ONE TIME COST ASSOCIATED WITH THIS COURSE. THE RECURRING COST IS $65 PER YEAR TRANSFER FROM BASE.

KIN 418-4 Elector Pysiological Techniques Laboratory

Revised

THERE IS NO ONE TIME COST ASSOCIATED WITH THIS COURSE. THE RECURRING COST ASSOCIATED WITH THIS COURSE IS $50 PER YEAR TRANSFER FROM BASE.

KIN 486-3 Industrial Design

Revised

THERE IS NO ONE TIME COST ASSOCIATED WITH THIS COURSE. THE RECURRING COST ASSOCIATED WITH THIS COURSE IS $100 PER YEAR TRANSFER FROM BASE.

OTHER COURSES:

THERE ARE NO COSTS ASSOCIATED WITH OTHER COURSES IN THIS GROUP.

COST SUMMARY	One Time Costs	Recurring Costs
KIN 201	100	50
KIN 207	100	0
KIN 280	0	100
KIN 380	200	0
KIN 382	0	534*
KIN 402	200	0
KIN 412	0	65
KIN 418	0	50
KIN 486	0	100
Total	$600	~~$999~~ 899

addition error

* This cost may be deleted or reduced in the event that the School deletes journals from its existing order list.

I trust all the details are in order, please contact me if they are not.

RS

c. c. Sharon Thomas, Head Collections Management
Parveen Bawa

85a

Kinesiology Major Program Requirements

The basic credit hour requirements underlying the Major Program are as follows:

Kinesiology (lower division specified)	15 semester hours
Faculty of Science (lower division specified)	31 semester hours
Kinesiology (upper division specified)	12 semester hours
Statistics (upper division specified)	3 semester hours
Kinesiology (upper division unspecified)	27 semester hours
Electives (lower division, partly specified)	6 semester hours
Electives (upper division unspecified)	3 semester hours
Free Electives (upper or lower division unspecified)	23 semester hours
TOTAL	120

Lower Division Core (specified courses for all Areas of Concentration):

Kinesiology

KIN 142-3	Introduction to Kinesiology
KIN 201-3	Introduction to Biomechanics
KIN 203-3	Microcomputer Applications in Kinesiology (or CMPT 103-3)
KIN 205-3	Introduction to Human Physiology
KIN 207-3	Information Processing in Human Motor Systems

(15 semester hours)

Biology

BISC 101-4	General Biology

(4 semester hours)

Biochemistry

BICH 221-3	Cellular Biology and Biochemistry

(3 semester hours)

Chemistry

CHEM 102-3	General Chemistry I
CHEM 115-2	General Chemistry Laboratory I
CHEM 150-3	Organic Chemistry I
CHEM 155-2	Organic Chemistry Laboratory I

(10 semester hours)

Mathematics

MATH 154-3	Calculus I for the Biological Sciences (or MATH 151-3 - Calculus I)
MATH 155-3	Calculus II for the Biological Sciences (or MATH 155-3 - Calculus II)

(6 semester hours)

Physics

PHYS 101-3	General Physics I (or PHYS 120 -3 - Modern Physics and Mechanics)
PHYS 102-3	General Physics II (or PHYS 121 -3 - Optics, Electricity & Magnetism)
PHYS 130-2	General Physics Laboratory A (or PHYS 131-2 - General Physics Laboratory B)

(8 semester hours)

TOTAL SPECIFIED LOWER DIVISION CREDITS: 46 semester hours

Lower Division Elective Requirements (each Area of Concentration has its own set of recommended courses within the following framework):

A minimum of six semester hours must be selected from one or more of the following departments: Business Administration, Communication, English, Philosophy, Psychology, Political Science, or Sociology and Anthropology.

(6 semester hours)

TOTAL LOWER DIVISION REQUIREMENTS: 52 semester hours

Upper Division Core (specified courses for all Areas of Concentration):

Kinesiology

KIN 305-3	Human Physiology I
KIN 306-3	Human Physiology II
KIN 326-3	Functional Anatomy
KIN 407-3	Human Physiology Laboratory

(12 semester hours)

Statistics

STAT 301-3	Statistics for the Life Sciences

(3 semester hours)

TOTAL SPECIFIED UPPER DIVISION CREDITS: 15 semester hours

Upper Division Electives (each Area of Concentration has its own set of recommended courses within the following framework):

a) Twenty-seven semester hours (minimum) of Kinesiology upper division courses from the following list:- KIN 301-3, 303-3, 320-3, 336-3, 343-3, 367-3, 375-3, 380-3, 382-3, 383-3, 402-3, 410-3, 412-3, 415-3, 418-4, 426-3, 430-3, 431-3, 442-3, 460-3, 461-3, 467-3, 485-4, 486-3, 496-3, 498-3, and including not more that 9 hours from 420-3, 421-3, and 422-3. Students may substitute BICH 321 to help satisfy this requirement.

b) Three semester hours from courses offered in any discipline within the University.

TOTAL UPPER DIVISION REQUIREMENTS: 45 semester hours

Free Electives

A further 23 semester hours are free electives and may be taken from any discipline within the University at either the lower or upper division level.

ADMISSION INTO THE MAJOR PROGRAM IN KINESIOLOGY

The Senate Committee on Academic Planning approved three routes of entry into the Kinesiology Major Program:

1. INTERNAL TRANSFER STUDENTS FROM WITHIN SFU

Current SFU students will be eligible for formal acceptance into the Kinesiology Major Program (BSc) if they:

a) fill out a Program Approval form (available at the Academic Resource or Kinesiology General Office) and submit it to the Kinesiology General Office by September 30 (for fall semester approval), January 31 (for spring semester approval), or May 31 (for summer semester approval)

b) have completed Biology 12 and Mathematics 12 (or equivalents), and at least one of Chemistry 12 and Physics 12 (or equivalents)

c) have completed at least 30 semester hours of credit, including at least 24 semester hours from the following:
KIN 142, KIN 201, KIN 203(or CMPT 103), KIN 205, KIN 207
BISC 101
BICH 221
CHEM 102, CHEM 115, CHEM 150, CHEM 155
MATH 151 or MATH 154, MATH 152 or MATH 155
PHYS 101 or 120, PHYS 102 or 121, PHYS 130 or 131

d) have a 2.00 G.P.A. or higher calculated from the 24 semester hours (minimum) listed above.

When the number of eligible applicants exceeds the number that can be accommodated, the University reserves the right to select from among the qualified candidates.

SCAP approved the requirements for acceptance as a major. The requirements were not considered by SUAB since this action is not an admission action and therefore falls outside of the scope of responsibility of SUAB.

2. STUDENTS FROM SECONDARY SCHOOLS

High school students will be eligible for formal acceptance into the Kinesiology Major Program (BSc) if they:

a) fulfill the general University admission requirements;

and they are *strongly recommended* to:

b) complete Biology 12 with a minimum grade of C+ (67%)
c) complete Mathematics 12 with a minimum grade of B (73%)
d) complete at least one of Chemistry 12 or Physics 12 with a minimum grade of C+ (67%).

When the number of eligible applicants exceeds the number that can be accommodated, the University reserves the right to select from among the qualified candidates.

This wording is consistent with action taken by the Senate Undergraduate Admissions Board which rejected the Kinesiology recommendation that the courses listed in b) c) and d) above be *required* courses. However, SCAP wishes to point out to Senate that the SUAB action means that admission to the major program will be possible for some high school graduates who have not taken <u>any</u> science pre-requisites in high school.

3. TRANSFER STUDENTS FROM RECOGNIZED POST-SECONDARY INSTITUTIONS

Transfer students will be eligible for formal acceptance into the Kinesiology Major Program (BSc) if they:

a) fulfill the general University admission requirements;

b) have completed at least 30 semester hours of transfer credit, including at least 24 transfer credits in the following:

KIN 142, KIN 201, KIN 203(or CMPT 103), KIN 205, KIN 207
BISC 101
BICH 221
CHEM 102, CHEM 115, CHEM 150, CHEM 155
MATH 151 or MATH 154, MATH 152 or MATH 155
PHYS 101 or 120, PHYS 102 or 121, PHYS 130 or 131

c) have a 2.00 G.P.A. or higher calculated from 24 of the transfer credits listed above

and they are *strongly recommended* to:

d) complete Biology 12 and Mathematics 12 (or equivalents), and at least one of Chemistry 12 and Physics 12 (or equivalents).

When the number of eligible applicants exceeds the number that can be accommodated, the University reserves the right to select from among the qualified candidates.

This wording is consistent with action taken by the Senate Undergraduate Admissions Board which rejected the Kinesiology recommendation that the courses listed in d) above be *required* courses. However, SCAP wishes to point out to Senate that the SUAB action means that college transfer students are not required to have the necessary breadth of science preparation.

As they stand before Senate, the three routes for entry into the Kinesiology Major program are not consistent because of SUAB's action. If 2. and 3. are approved by Senate, Kinesiology will be required to treat school and college applicants on an equal basis and will not be able to give priority to those students who have completed the "strongly recommended" high school science courses.

BACKGROUND ON DIRECT ADMISSION PROPOSAL
School of Kinesiology, SFU

Joe Van Snellenberg
Craig Asmundson
January 21, 1994

I. Introduction

This report sets out objectives and targets for direct admission in the School of Kinesiology. It is based on the assumption that the School has the potential for moderate growth in its Major program, due to these factors:

1. Kinesiology can be better known amongst the high school population than it currently is;
2. The establishment of Areas of Concentration will provide focus to the program and help define Kinesiology for the non-initiated;
3. Growth in job opportunities to Kinesiology, especially in ergonomics;
4. Course scheduling and class enrolment can be improved so that a moderate increase in the number of Kinesiology Majors will not require more instructors.

Direct admission to the School of Kinesiology will be a two step process:

1. Students must first satisfy the University admissions requirements and be admitted to the University.
2. Then, if students have completed certain science courses required by the School of Kinesiology, they will be eligible for direct entry to the Kinesiology Major Program (i.e.) immediate approval as Kinesiology Majors.

II. Rationale For Direct Admissions

1. Direct admissions will result in better service to students because it will significantly increase the probability that Kinesiology students will be able to get their necessary courses in a reasonable time frame. Currently, students either don't always get courses when they require them or they end up taking unnecessary courses so that they can increase their RPN (Registration Priority Number) and thus increase the probability of getting the courses that they really want. This is a waste of the student's time and of the University's resources.

2. Guaranteed program admission will assist in attracting and recruiting the best-qualified students into our program. There are other Kinesiology and related programs in Canada who have direct admissions policies and who guarantee spaces for the newly admitted majors into the courses which they need. We have lost prospective students to these programs because we don't have a direct admissions policy which enables us to set aside space in courses for newly admitted majors.

3. Enrolment management - direct admissions will allow the School of Kinesiology to better identify and make contact with Kinesiology majors in their first semester and better plan the scheduling of our lower division and upper division required courses. Admission directly to the Major will enable new students to access 100 division Kinesiology courses for which presently they may have insufficient priority. We want students to be able to come to SFU and have some guarantee of getting courses when they want them and need them so that they can progress through their program in a planned fashion and graduate in four years if they desire.

4. Admission requirements can be specific to the science-based nature of the Kinesiology program, enabling students to properly prepare in secondary school and to enable them to complete the degree in four years.

5. There is a precedent for direct admissions at Simon Fraser University. The School of Engineering Science in the Faculty of Applied Science has had a direct admissions policy since its inception and the Faculty of Science has had a direct admissions policy for the past two years. These direct admissions policies appear to be working well. Because of the diversity of the schools in the Faculty of Applied Science (Computing Science, Communication, Engineering Science, Kinesiology, and Resources Management), we can't have direct admissions to our Faculty as the Faculty of Science has done.

III. Program Approval Targets

Approximately 100 students annually become intended Kinesiology majors. Of these, 60% are admitted to Simon Fraser University from high school, 35% from post-secondary institution (college plus university) transfer, and 5% from other sources. 57% of current approved majors intended on majoring in Kinesiology upon University entrance. Implementation of direct admission is expected to increase this percentage over time to 75%.

Therefore, the *future* of program approvals for Kinesiology should have targets similar to the chart below, assuming no major changes in faculty, budgets, etc.

Internal transfers	25
Ext. transfers (post-sec)	30
High School admissions	45
Other	5
Total	105

The above figures are put forth as targets for the 3rd year of direct admissions, 1996-97. The first two years will be an adjustment period in which Kinesiology direct admission gets known throughout B.C. high schools and in which the bulk of current intended majors become approved.

In working towards the above figures, the number of students approved per year will increase. In 1994-95, for example, the number of internal transfers should be the same as it has been, approximately 75. The high school admission target can begin at 25 since approximately this number of high school admissions would have qualified in September 1993. Since nearly all current college and university transfer students would qualify under direct admission, almost the full future target of 30 can be started immediately.

1994-95 Targets

Internal transfers	75
Ext. transfers (post-sec)	25*
High School admissions	25*
Other direct admissions	5*
Total	130

1995-96 Targets

Internal transfers	50
Ext. transfers (post-sec)	30*
High School admissions	35*
Other direct admissions	5*
Total	120

For the second year, 1995-96, the number of internal transfers can be reduced by approximately the number of external transfers from the first year.

1996-97 Targets

Internal transfers	25
Ext. transfers (post-sec)	30*
High School admissions	45*
Other	5*
Total	105

* Figures do not include "no-shows". Admissions Office to increase # of acceptances based on established patterns.

Note that a high school student currently in grade 11 or 12 is not penalized or restricted by this system. If, by not being aware of direct admission, they did not choose appropriate courses to qualify for direct entry into Kinesiology, the internal transfer route is just as open as it was previously.