

SIMON FRASER UNIVERSITY

S.81-12

MEMORANDUM

To..... SENATE

From..... SENATE COMMITTEE ON UNDERGRADUATE
STUDIES

Subject..... CHANGES - KINESIOLOGY CURRICULUM

Date..... DECEMBER 19, 1980

Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of December 9, 1980 gives rise to the following motion:

- MOTION: "That Senate approve and recommend approval to the Board of Governors, as set forth in S.81-12, the proposed changes in Kinesiology:
- i) KIN. 305-3 - Human Physiology I - formerly KIN. 405-3 (number change)
 - ii) KIN. 306-3 - Human Physiology II - formerly KIN. 406-3 (number change)
 - iii) Add CHEM 118-2 - General Chemistry Laboratory II as a required lower division course
 - iv) Change requirements to permit use of courses from BUS., ENGL, PHIL, PSYC, S.A., CMNS (deleting POL.)
 - v) Add KIN. 401-4 - Mechanics of Human Movement as a required upper division course for a Major in KIN.
 - vi) New course - KIN. 410-3 - Exercise Physiology, as an upper division elective for a Major in KIN.
 - vii) Revised courses for those taking a Degree with a Major in Kinesiology
 - viii) Revised upper division courses for those taking a Major in Kinesiology."

FOR INFORMATION

Under its delegated authority, and subject to approval by Senate and by the Board of Governors, SCUS approved waiver of the time lag requirement to permit first offering of KIN. 410-4 in the Summer semester 81-2.

John V. Webster

SIMON FRASER UNIVERSITY

SCUS 80-97

MEMORANDUM

To..... Mr. H.M. Evans, Registrar and
Secretary to the Senate Committee
on Undergraduate Studies

From..... Janet Blanchet, Secretary to the
Faculty of Interdisciplinary Studies
Undergraduate Curriculum Committee

Subject..... Kinesiology Curriculum Changes
I.S.C. 80-28

Date..... 20 November 1980

The following curriculum changes were discussed and approved at a meeting of the Faculty of Interdisciplinary Studies Undergraduate Curriculum Committee held on Tuesday, November 18, 1980:

KIN. 405-3, Human Physiology I, and

KIN. 406-3, Human Physiology II

- to be renumbered to KIN. 305-3 and KIN. 306-3 respectively.

This renumbering is intended to encourage students to undertake the above two courses earlier in their programs.

CHEM 118-2, General Chemistry Laboratory II

- to be added to the Kinesiology undergraduate curriculum as a required course, pending Senate approval.

The last two lines on page 356 of the 1980-81 Calendar are to be revised to read as follows:

- "Two courses from Business Administration, English, Philosophy, Psychology, Sociology and Anthropology, and Communication."

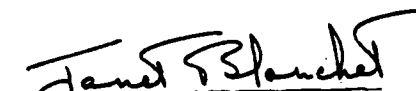
KIN. 401-4, Mechanics of Human Movement

- is to be added to upper division requirements for Kinesiology majors. This is not a new course.

KIN. 410-3, Exercise Physiology

- is a new course which is to be added as an upper division elective for Kinesiology majors.

Please place the foregoing items on the next agenda for the Senate Committee on Undergraduate Studies.


Janet Blanchet

JB:jk

Attachments

From

KIN. 405-3 Human Physiology I (Physiology of Motor Activity)
 Normal and abnormal functions of the cardiovascular and respiratory systems of man and their adaptations to exercise and environmental stress. Principles of human nutrition, the role of energy balance and essential nutrients in normal and athletic performance.
 (Lecture/Tutorial)

Prerequisites: KIN. 100-3, BISC 201-3, CHEM 251-3, 256-2.
 Students with credit for KIN. 405-3 under its former title "Physiology of Motor Activity" may not take this course for further credit.

To

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KIN. 405-3 Human Physiology I (Physiology of Motor Activity)
 Normal and abnormal functions of the cardiovascular and respiratory systems of man and their adaptations to exercise and environmental stress. Principles of human nutrition, the role of energy balance and essential nutrients in normal and athletic performance.
 (Lecture/Tutorial)

Prerequisites: KIN. 100-3, BISC 201-3, CHEM 251-3, 256-2.
 Students with credit for KIN. ~~405-3~~ ³⁰⁵ under its former title "Physiology of Motor Activity" may not take this course for further credit.

or its former number KIN. 405-3

From

KIN. 406-3 Human Physiology II (Principles of Physiological Regulation)
 The control systems of the human body, principles of physiological regulation. The structure and function of the central nervous system and the endocrine system. Special senses, and sensation, neurological and endocrine control mechanisms and neuroendocrine interactions.
 (Lecture)

Prerequisite: KIN. ~~405-3~~ ³⁰⁵

To

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KIN. 406-3 Human Physiology II (Principles of Physiological Regulation)
 The control systems of the human body, principles of physiological regulation. The structure and function of the central nervous system and the endocrine system. Special senses, and sensation, neurological and endocrine control mechanisms and neuroendocrine interactions.
 (Lecture)

Prerequisite: KIN. ~~405-3~~ ³⁰⁵

Students with credit for KIN. 306-3 under its former number KIN. 406-3 may not take this course for further credit

KINESIOLOGY PROGRAM CHANGE

Since 1973 the Department of Kinesiology has indicated availability of three major areas of special emphasis in the undergraduate program. They are: Applied Physiology, Rehabilitation Science and Sports Science and Recreation (pp. 368-360 of 1980-1981 Calender). With the growing interest in Kinesiology, especially in Applied Physiology, Occupational Health and Sports Science, new courses have been mounted in these areas so that graduates from Kinesiology at Simon Fraser University will remain well prepared. It is the unanimous opinion of the Department that while maintaining a general degree program in Kinesiology, those who want to concentrate in any of the special emphasis areas, should be able to do so. Therefore, the changes outlined are proposed to introduce:

- (1) An Honors program in Applied Physiology
- (2) An Honors program in Occupational Health Sciences
- (3) A Diploma in Occupational Health Sciences
- (4) A minor in Occupational Health Sciences

These replace the regulations and requirements shown on pp. 356-360 of the 1980-81 Calender.

There are no additional requirements for faculty or resources to introduce the Applied Physiology Honors as the major area of teaching and research in the department is in Applied and Environmental Physiology.

Estimate of additional resources (library, laboratory, faculty, etc.) for the Occupational Health Science honors, diploma and minor will be provided separately by Dr. Tom Smith.

Assuming that the OHS programs are approved by the Department, the course requirements of all the major programs are listed below.

It is evident that the lower level requirement for all the majors in the department is the same. Specific and elective upper division courses are listed for each program.

Registrar's Note: The request for an Honors Program in Applied Physiology is addressed in a paper separate from this one, as is Occupational Health Science

REVISED COURSES FOR A MAJOR IN KINESIOLOGY:

BIOLOGICAL SCIENCES:

- Bisc. 101-4 - Introduction to Biology
 - Bisc. 102-4 - Introduction to Biology
 - Bisc. 201-3 - Cell Biology
- (11)

CHEMISTRY:

- Chem. 104-3 - General Chemistry I
 - Chem. 105-3 - General Chemistry II
 - Chem. 115-2 - General Chemistry Laboratory I
 - Chem. 118-2 - General Chemistry Laboratory II
 - Chem. 251-3 - Organic Chemistry
 - Chem. 256-2 - Organic Chemistry laboratory
- (15)

MATHEMATICS:

- Math. 151-3 - Calculus I or (b) Math. 154 - Calculus I for Bisc. (6)
- Math. 152-3 - Calculus II or (b) Math. 155 - Calculus II for Bisc.

PHYSICS:

- Phys. 101-3 - General Physics I
 - Phys. 102-3 - General Physics II
- (6)

COMPT. SCIENCE:

- Compt 103-3 - Higher language (Fortran)
- Compt 142-1 - Project in Kinesiology

KINESIOLOGY:

- Kin. 100-3 - Introduction to Human Structure and Function
 - Kin. 142-3 - Introduction to Kinesiology
- (5)

Two courses from Business administration, English, Philosophy, Psychology, Sociology and Anthropology or Communication. The remaining 5 hours from any department in the University

UPPER DIVISION REQUIREMENTS FOR A MAJOR IN KINESIOLOGY:

Kin. 305-3	-	Human Physiology I	(3)
Kin. 306-3	-	Human Physiology II	(3)
Kin. 326-3	-	Functional Anatomy	(3)
Kin. 401-4	-	Mechanics of Human Movement	(4)
Kin. 407-3	-	Human Physiology Laboratory	(3)

(16)

and 26 hours from any of the following:

Kin. 303-3	-	Kinanthropometry
Kin. 320-3	-	Cultural aspects of Human movement
Kin. 330-3	-	Human Energy metabolism
Kin. 336-3	-	Microscopic Anatomy (Histology)
Kin. 341-3	-	Sports medicine I
Kin. 343-3	-	Fitness Appraisal and Guidance
Kin. 367-3	-	Psychology of Motor Performance and Skill Aquisition
Kin. 402-4	-	Mechanical Properties of Tissues
Kin. 410-3	-	Exercise Physiology
Kin. 420-3	-	Selected topics in Kinesiology I
Kin. 421-3	-	Selected topics in Kinesiology II
Kin. 422-3	-	Selected topics in Kinesiology III
Kin. 441-3	-	Sports Medicine II
Kin. 442-3	-	Biomedical Systems
Kin. 467-3	-	The Components of Skilled Performance
Kin. 485-4	-	Man Beneath the Sea
Kin. 496-3	-	Directed study
Kin. 498-3	-	Undergraduate research
Bich 440-3	-	Neurochemistry
MS. 480-3	-	Ergonomics/Human Factors in working environment

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Kinesiology

Abbreviation Code: KIN. Course Number: 410 Credit Hours: 3 Vector: 2-2-0

Title of Course: Exercise Physiology

Calendar Description of Course: This is an applied physiology course aimed at advanced study of human physiological responses and adaptations to acute and chronic exercise stress. Cardio-respiratory, cellular, and metabolic adaptations to exercise will be studied and discussed in detail to provide a scientific basis for training and conditioning.

Nature of Course Lecture / Seminar

Prerequisites (or special instructions): KIN. 305-3, KIN. 306-3.

Amey

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 / year ---once / 3 semesters

Semester in which the course will first be offered? 1981-2 1981-3

Which of your present faculty would be available to make the proposed offering possible? Dr. J. Wilkinson, Dr. C. Bolter, Dr. E. Banister, Dr. T. Smith.

3. Objectives of the Course

- 1. To study the physiological responses of the human body to acute and chronic exercise.
2. To develop an understanding of the adaptive capacity of human physiological systems to exercise stress.
3. To provide a scientific understanding of the principles of training and conditioning.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library

Audio Visual

none

Space

Equipment

5. Approval

Date: 10 Nov 80

E. Banister
Department Chairman

21 NOV 80

J. Bolter
Dean

DEC 9 '80

J. Bolter
Chairman, SCUS

EXERCISE PHYSIOLOGY

(2-2-0)

KINESIOLOGY 410-(3)

OBJECTIVES:

- (1) To study the physiological responses of the human body to acute and chronic exercise.
- (2) To develop an understanding of the adaptive capacity of the human body to exercise stress.
- (3) To provide a foundation for the understanding principles of exercise testing, exercise prescription? and physical training and conditioning.

SCHEDULING:

2 hours lecture, 1 hour seminar, 1 hour tutorial

SUGGESTED TEXTS:

- (1) Astrand, P.O. and Rodahl, K. Textbook of Work Physiology. Toronto, McGraw Hill, 1977.
- (2) Mathews, D.K., and Fox, E.L., The Physiological Basis of Physical Education and Athletics, Toronto. W.B. Saunders Co. 1976.

PREREQUISITES:

(~~KIN.~~ 100-3, ~~KIN.~~ 405-3, ~~KIN.~~ 406-3)

SUGGESTED LECTURE TOPICS:

() = Number of lectures?

PART ONE: (8) THE NATURE OF MUSCULAR ACTIVITY:

- (1) INTRODUCTION - The nature of Physical Exercise (Definitions).
- (2) ENERGY SUPPLY FOR MUSCULAR ACTIVITY:
 - (a) high energy phosphates
 - (b) aerobic and anaerobic energy supply
 - (c) oxidative processes and ATP formation
 - (d) capacity and power of energy yielding processes

(3) FUEL UTILIZATION DURING MUSCULAR EXERCISE:

- (a) carbohydrates and glycogen stores
- (b) fat metabolism during prolonged exercise
- (c) protein metabolism (Alanine-Glucose cycle)
- (d) endocrine adaptations: control of substrate supply and improved metabolic efficiency
- (e) nutritional considerations of physical performance

(4) NEUROMUSCULAR PERFORMANCE:

- (a) recruitment of motor units during exercise
- (b) control of muscular activity
- (c) dynamic properties of muscle
- (d) skeletal muscle fiber chronic adaptations to exercise

PART TWO: (8) CARDIO-RESPIRATORY ADJUSTMENTS DURING EXERCISE:

(1) THE CARDIOVASCULAR SYSTEM:

- (a) heart rate, stroke volume and cardiac output during exercise (myocardial adaptations to chronic exercise)
- (b) oxygen transport system adaptations to exercise (Hematocrit, Hb, myoglobin, 2, 3, DPG, Blood volume)
- (c) changes in blood pressure and blood flow during exercise
- (d) exercise and C.H.D.

(2) THE RESPIRATORY SYSTEM:

- (a) pulmonary ventilation during exercise and control of ventilation (rate and depth of ventilation)
- (b) pulmonary blood flow and control during exercise
- (c) oxygen transport system adaptations to exercise (hematocrit, Hb, myoglobin, 2, 3, DPG, Blood Volume)
- (d) energy cost of breathing
- (e) factors limiting oxygen transport and Vo_2 Max.

(3) THERMAL ADJUSTMENT TO EXERCISE:

- (a) heat production, thermal acclimatization
- (b) thermoregulation during exercise
- (c) warm-up?

PART THREE: (8) FACTORS AFFECTING PHYSICAL WORK CAPACITY:
the effects of training

(1) ADAPTATIONS TO CHRONIC EXERCISE:

- (a) metabolic adaptations
- (b) cardio-respiratory adaptations
- (c) cellular adaptations (muscle, bone connective tissue adipose tissue cellularity)
- (d) neuromuscular adaptations
- (e) effects of age & sex on physical work capacity
- (f) work in altered environments (hypo-hyperbaric conditions)

(2) OPTIMUM TRAINING PATTERNS:

- (a) training principles
- (b) anaerobic training stimulus
- (c) aerobic training stimulus
- (d) interval vs. continuous work
- (e) factors leading to fatigue

(3) OTHER TOPICS:

- (a) analysis of specific athletic events or sports
- (b) genetic endowment and physical performance