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www.sfu.ca/vpacademic**MEMORANDUM**

ATTENTION Senate **DATE** June 19, 2013
FROM Jon Driver, Vice-President, Academic and Provost, and Chair, SCUP **PAGES** 1/1
RE: Faculty of Science: Full Program Proposal for an Occupational Ergonomics Certificate in the Department of Biomedical Physiology and Kinesiology (SCUP 13-28)

At its June 19, 2013 meeting, SCUP reviewed and approved the Full Program Proposal for an Occupational Ergonomics Certificate in the Department of Biomedical Physiology and Kinesiology within the Faculty of Science, effective Spring 2014.

Motion:

That Senate approve and recommend to the Board of Governors the Full Program Proposal for an Occupational Ergonomics Certificate in the Department of Biomedical Physiology and Kinesiology within the Faculty of Science, effective Spring 2014.

c: R. Dill
A. Arnold


A handwritten signature in dark ink, appearing to be "Jon Driver".



OFFICE OF THE ASSOCIATE VICE-PRESIDENT, ACADEMIC

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MEMORANDUM

ATTENTION	Senate Committee on University Priorities	DATE	June 7, 2013
FROM	Gordon Myers, Chair Senate Committee on Undergraduate Studies	PAGES	1/1
RE:	Faculty of Science (SCUS 13-28b)		

Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of June 8, 2013, gives rise to the following recommendations:

Motion

That SCUP approve and recommend to Senate the Full Program Proposal for the Occupational Ergonomics Certificate in the Department of Biomedical Physiology and Kinesiology within the Faculty of Science.

The relevant documentation for review by SCUP is attached.

Full Program Proposal
Occupational Ergonomics Certificate
Department of Biomedical Physiology and Kinesiology
Undergraduate Program Committee
Simon Fraser University
April 19th, 2013

Executive Summary

- The latest Biomedical Physiology and Kinesiology external review (2011) recommended focusing our teaching resources in ergonomics towards a “limited number of courses focused on occupational ergonomics and rehabilitation”.
- The proposed Occupational Ergonomics Certificate addresses the external review committee’s concerns by offering a targeted collection of courses in occupational application.
- Occupational Ergonomics has been determined to be of interest to students and of significant, growing demand in the labor market. While only one or two students graduate in our Ergonomics Concentration each year, our courses in this area run yearly with more than fifty students enrolled.
- Identifying this collection of courses with a certificate designation is important for students entering the labor market, particularly those that cannot meet the full requirements for professional certification but who will be able to incorporate ergonomics into their skill set. It is also important for former graduates of Kinesiology program who are encouraged by employers to add to their skill set by taking the certificate.
- Employers are increasingly encouraging professional certification in Ergonomics. The Canadian College for the Certification of Professional Ergonomists (CCPE) requires a significant number of lecture hours directly related to ergonomics for professional certification. The Department of BPK is no longer able to teach all of the courses in the areas previously incorporated into the Ergonomics Concentration (Major Program) due to limited resources. Students’ perception of the Ergonomics Concentration has also been that it is quite onerous.
- The proposed Occupational Ergonomics Certificate will provide a significant portion of the education hours required for CCPE certification. Students could choose specific electives and extra courses from within, and outside, the Department of BPK to meet the requirements of CCPE certification if desired. This volume of work, however, would be beyond the expectations of a Bachelors degree (fifty eight upper division units to meet SFU requirements and CCPE certification – based on the last time we offered a program that met certification (2008)).
- Students will normally be Kinesiology Majors and will apply for admission into the Occupational Ergonomics Certificate.
- The proposal addresses the SFU vision of being research-driven, student-centered and community-engaged.
- The Undergraduate Program Committee of the Department of Biomedical Physiology and Kinesiology will direct the program.
- Graduates with the Occupational Ergonomics Certificate will have career ready skills and will be well prepared to move on to:

- Employment in careers that address health and wellness in the workplace such as: corporate or research ergonomist, return to work specialists, workplace wellness professionals, and policy development.
- The Occupational Ergonomics Certificate will meet a significant portion of the Professional Certification Requirements of the Association of Canadian Ergonomists.
- Professional degrees in Occupational Therapy, Physical therapy, Industrial Hygiene, etc.
- Graduate degrees in related areas.

Background

The Department of Biomedical Physiology and Kinesiology (BPK) has offered an opportunity for students to study and apply their knowledge in the specialized area of Ergonomics/ Human Factors since the department's inception. Many graduate and undergraduate students have completed their BPK degrees with an Ergonomics specialty and have continued on to be leaders in the Ergonomics field in research, policy and industry.

Over the years the Ergonomics offerings have changed to reflect the interests and availability of faculty and students resulting, in recent years, in an Ergonomics Concentration within the BPK BSc. Major. This Concentration was designed to provide a broad foundation in the area of Ergonomics/Human Factors (occupational ergonomics, environmental ergonomics, computer interaction, product design, and organizational design) in an effort to meet the significant number of lecture hours directly related to ergonomics required for professional certification by the Canadian College for the Certification of Professional Ergonomists (CCPE) which is increasingly being encouraged by employers. Efforts to re-design the current Ergonomics Concentration to accommodate CCPE requirements have been hampered by an inability to offer courses consistently (due to faculty retirements which have not been replaced) as well as by a perception by students that the requirements to complete the concentration are too onerous. Efforts to share resources with other departments (cross listing) and creative scheduling have not resulted in increased enrolment despite student interest and strong employment prospects in the field.

The proposed Occupational Ergonomics Certificate is a streamlined offering of current courses that will provide a significant portion of the CCPE education hours required. For many students who do not intend to be full ergonomists, but only apply some parts of the practice in their professions (physiotherapy, return to work etc.), the certificate will serve to identify their expertise to potential employers. Students who wish to fully specialize in the field ergonomics could choose specific electives and extra courses from within, and outside, the Department of BPK to meet the requirements of CCPE certification if desired. This volume of work, however, would be beyond the expectations of a Bachelors degree.

The proposed certificate is directed at the study of the workplace, a prime area of interest of BPK students, and a targeted labour market growth area. Occupational health issues in general, and ergonomics in specific, is a key application area for Kinesiologists as they strive to create healthy individuals, organizations and environments in a future workplace of aging, diverse workers and rapid technological change. By focusing our offerings in this key area we can provide students with the knowledge they need to excel while allowing them to complete their studies in a timely manner.

With the proposed changes, it can be reasonably expected that the number of students drawn to the new Certificate will exceed the numbers of students currently drawn to the existing concentration of Ergonomics within the Kinesiology Major.

1. **Credential to be awarded:** Occupational Ergonomics Certificate
2. **Location:** SFU, Burnaby Campus
3. **Faculty/Department/School offering the new program:** Faculty of Science/ Department of Biomedical Physiology and Kinesiology
4. **Anticipated program start date:** January 2014
5. **Description of proposed program:**
 - a) **Aims, goals, and/or objectives**

The intent of this proposal is to consolidate the current Ergonomics Concentration course offerings into a streamlined, and career focused Ergonomics Certificate, which addresses student demand for essential foundations in the Occupational Ergonomics discipline. The new certificate will eliminate three undersubscribed courses currently in the Ergonomics Concentration (BPK 488, BPK 486 and BPK 380) and distill critical Occupational Ergonomics related material into one new course (BPK 482). This change will meet several objectives:

- Prepare students to address the demographic and technological changes in the workplace through the exploration of the science and application of Occupational Ergonomics;
- Provide a mechanism for students to explore the discipline of Ergonomics without having to commit to a full concentration;
- Focus pedagogy on Occupational Ergonomics-related issues which have been identified by BPK students as a gap in their education;
- Provide consistent, reliable offerings of key courses;
- Provide community engagement through practicum placements;
- Eliminate undersubscribed courses without losing content critical to student development.
- Meet the needs of the labor market

b) Anticipated contribution to mandate and strategic plan of the institution

The proposed certificate meshes well with the SFU vision and strategic plan of the BPK Department.

i) Research-driven, Student-centered, Community-engaged

The certificate proposes to better use the resources already existing within the department to combine a set of courses that engages both the student and the workplace communities. The certificate will address students' concerns of wanting to complete courses more quickly with purposeful, career-ready content and will provide employers with students who have the ability to translate knowledge into practice.

ii) External Review

The proposal also strives to meet the recommendations of the recent BPK external review which identified the Ergonomics specialization as under-enrolled as a program of study *per se*. The Review Team recommended that the Department facilitate the "incorporation of a limited number of ergonomics courses focused on occupational and rehabilitation into the active health and rehabilitation area of concentration".

"The Review Team recommends that the Department make a strategic decision regarding the extent to which they wish to support the ergonomics component of the undergraduate program Elimination of the formal stream/specialization as it currently exists (as a conduit toward preparing students to meet professional standards) ... seems inevitable without a major commitment of resources. Incorporation of a limited number of ergonomics courses focused on occupational and rehabilitation into the active health and rehabilitation area of concentration is a reasonable approach given the current availability of resources ..."

This proposal addresses this recommendation.

c) Target audience

The target audience for the proposed Occupational Ergonomics Certificate is primarily current BPK students in the Kinesiology Major. While BPK students continue to express interest in the discipline of Ergonomics, and the career market is strong, students have not committed to the concentration largely due to the excessive number of courses required (more credits than other concentration) and lack of consistent course offerings. By providing the more focused and streamlined Occupational Ergonomics Certificate, students can explore the discipline of Occupational Ergonomics and gain skills which are transferable to an entry-level career in the field as well as gaining knowledge and skills transferable to other areas of interest such as active rehabilitation, corporate wellness development and Government policy.

A secondary target audience is professionals practicing in the areas of occupational rehabilitation, corporate wellness, and occupational health and safety who want to augment their knowledge and skills in the area of Ergonomics to meet corporate goals and/or achieve the requirements for certification or continuing education credits required by professional associations.

d) Content

The Occupational Ergonomics Certificate will require 24 credits, 12 of which are required, with the remaining 12 selected from a list of electives.

Prerequisite and Required Course Grades

Students enrolling in biomedical physiology and kinesiology courses must have a grade of C- or better in prerequisite courses. Students enrolled in this certificate program must have grade of C- or better in all required courses.

Program Requirements

Students complete all of

- BPK 180W Introduction to Ergonomics(3)
- BPK 381 Psychology of Work(3)
- BPK 481 Activity-Generated Musculoskeletal Disorders(3)*
- BPK 482 Ergonomics and Rehabilitation(3)*

and four of

- BPK 303 Kinanthropometry(3)
- BPK 382 Workplace Health and Safety(3)
- BPK 310 Exercise/Work Physiology(3)
- BPK 343 Active Health: Assessment and Programming(3)
- BPK 402 Mechanical Properties of Tissues(3)
- BPK 415 Neural Control of Movement(3)

BPK 426 Neuromuscular Anatomy(3)
BPK 448 Rehabilitation of Movement Control(3)
BPK 484 Altitude and Aerospace Physiology(3)
BPK 496 Directed Studies I (3)[#]
BPK 498 Directed Studies II (3)[#]

* course requires additional pre-requisites

[#] course must be in area related to Occupational Ergonomics

e) Delivery Methods

All of the courses are already in place and consist of lecture/lab/tutorial except for BPK 482, which is under development. This course will cover essential material from courses slated to be eliminated and will be delivered in a lecture/practicum format.

f) Linkages between learning outcomes and curriculum design

The learning outcomes for the Occupational Ergonomics Certificate include:

- Develop a framework of strategies to facilitate life-long learning in the discipline of Ergonomics
- Engage systems analysis techniques to address ergonomic concerns in the workplace
- Analyze the range of user needs, limitations and capabilities within the workplace
- Appreciate the importance of multidisciplinary approaches to problem solving in the workplace
- Use best practices to select defensible assessment tools and solutions
- Translate research-based knowledge of Ergonomics to the workplace
- Integrate ergonomics strategies to develop healthy individual, organizations and environments

These outcomes will be met by engaging a variety of formative and summative tools to create a student-centered learning environment. Teaching tools will vary from course to course and will include:

- Case studies
- Problem based computer simulations
- Practicum and portfolios
- Role playing
- Debates
- Lectures
- Peer teaching
- Lab activities
- Reflections

g) Distinctive characteristics

The Occupational Ergonomics Certificate will be distinct from any other certificate/program within the University and is more comprehensive than any other Occupational Ergonomics program in British Columbia.

h) Anticipated completion time

The certificate is intended to be completed within the four year BSc and could also be completed in a minimum of two years by a professional returning to the program.

i) Enrolment plan for the length of the program

The admission requirements will be the same as for the Major in Biomedical Physiology and Kinesiology. There will be an option for students already registered at SFU to transfer to the program, as long as they fulfill the qualification criteria. Initially, it is anticipated that approximately 30 students per academic year would be attracted to the program.

j) Policies on student evaluation

Students will be evaluated as per general regulations of Simon Fraser University and the Faculty of Science.

k) Policies on faculty appointment (minimum qualifications)

Continuing faculty will hold a minimum of an MSc or equivalent.

l) Policies on program assessment

All academic units at SFU are subject to external review every seven years.

m) Level of support and recognition from other post-secondary institutions (including plans for admission and transfer within BC) and relevant regulatory or professional bodies

As per SFU's transfer credit procedures, students may transfer from BC colleges or universities to enroll into this program. The Occupational Ergonomics Certificate will meet a significant portion of the Professional Certification Requirements of the Association of Canadian Ergonomists.

n) Evidence of student interest and labour market demand

Currently the proposed required courses in the certificate attract about 50 students each per academic year (BPK180W Introduction to Ergonomics, BPK 381 Psychology of Work, BPK 481 Activity-Generated Musculoskeletal Disorders).

This certificate shifts the focus of our ergonomic teaching towards occupational ergonomics and will include courses that are of interest to and will count as electives for all Kinesiology Majors. As there are about 100 graduates from the Kinesiology Major per year, it is anticipated that many of these students will see the value in completing the certificate in occupational ergonomics.

Many graduate and undergraduate students have completed their BPK degrees with an Ergonomics specialty and have continued on to be leaders in the Ergonomics field in research, policy and industry. Positions have been filled within Federal and Provincial governments, Workers Compensation Boards, Health Authorities, large manufacturing companies (NOKIA, RIM, Ford etc.), insurance companies and large service sector corporations.

Occupational Ergonomics will be a growth area as the working population ages, and the impact of mentally and physically healthy, productive workers is increasingly understood. The US Dept. of Labor identified Human Factors Engineers and Ergonomists as one the Eight Emerging Careers for 2013

"The field is strong due to the aging of the population, which creates demand for products and workplaces that are less physically demanding, and from businesses' demand for greater efficiency that can be built into work procedures," Larry Buhl, Monster Contributing Writer, 2012

Ergonomics contributes to the understanding of the impact of aging workers in a work environment with rapidly changing technology. Wellness programs in the workplace are growing as management recognizes the fiscal importance of addressing workers' health needs as well as the increasing requirements from workers' compensation board to address wellness issues through prevention rather than compensation. Rehabilitation from accidents and injuries requires professionals with a thorough understanding of the workplace system to ensure safe and effective placement and accommodation.

Occupational Ergonomics Certificate students can explore the discipline of Occupational Ergonomics and gain skills which are transferable to an entry-level career in the field as well as gaining knowledge and skills transferable to other areas of interest such as active rehabilitation, corporate wellness development and Government policy.

Recent articles in the Globe and Mail " and Seattle Times "Healthy demand for ergonomists" point to Occupational Ergonomics as a growing area of future employment.

"Demographic and technological changes in the workplace point to an increasing need for consideration of Occupational Ergonomics. Careers in this domain are strong and are expected to increase." (Globe and Mail, June 2011)

Other Canadian universities with ergonomics programs include Windsor, Waterloo , University of New Brunswick, Ryerson, University of Calgary, Carleton University, Dalhousie, McMaster, Queens, l'Université de Montréal, Université de Moncton, Université du Québec à Montréal. There are no other ergonomic programs in British Columbia.

o) Related programs at SFU and other British Columbia post-secondary institutions

Expanded content currently exists as the Ergonomics Concentration within a Biomedical Physiology and Kinesiology Major at SFU. The Ergonomics Concentration will be removed with the approval of the Certificate in Occupational Ergonomics.

UBC Faculty of Environmental Health and BCIT offer a few Occupational Ergonomics courses, but none provide a certificate.

p) Summary of resources required and available to implement the program

The programs can be accommodated with present courses and faculty. No new resources will be required to implement the program.

q) Description of any program and associated resources that will be reduced or eliminated when the new program is introduced

The current Ergonomics Concentration will be eliminated and replaced by the Certificate program. The current Concentration does not meet the requirements of the Certification of Professional Ergonomists (CCPE). The current concentration requires:

KIN 488-3 Ergonomics Laboratory

KIN 380-3 Occupational Biomechanics
6 units

and three of*

KIN 303-3 Kinanthropometry
KIN 310-3 Exercise/Work Physiology
KIN 381-3 Psychology of Work
KIN 382-3 Workplace Health
KIN 481-3 Activity-Generated Musculoskeletal Disorders
IAT 333-3 Interaction Design Methods†
IAT 334-3 Interface Design†
IAT 432-3 Design Evaluation
12 units

*The remaining five courses in the above list that are not used, may be used as electives (see electives course list below).
and six of

GERO 401-3 Aging and the Built Environment
KIN 343-3 Active Health: Assessment and Programming
KIN 367-3 Psychology of Motor Skill Acquisition
KIN 402-3 Mechanical Properties of Tissues
KIN 415-3 Neural Control of Movement
KIN 416-3 Control of Limb Mechanics
KIN 442-3 Biomedical Systems
KIN 448-3 Rehabilitation of Movement Control
KIN 461-3 Physiological Aspects of Aging
KIN 467-3 Human Motor Control
KIN 484-3 Altitude and Aerospace Physiology
KIN 485-4 Human Factors in the Underwater Environment
KIN 420-3 Selected Topics I*
KIN 421-3 Selected Topics II*
KIN 422-3 Selected Topics III*
KIN 423-3 Selected Topics IV*
KIN 496-3 Directed Studies I*
KIN 498-3 Directed Studies II*

†requires additional prerequisites

*can be counted towards area of concentration if relevant to ergonomics or human factors. 18 units

Total 52 units

A further 10 lower or upper division units of electives may be completed from any discipline within the university.

r) List of faculty members teaching and supervising

Faculty	Teaching/Supervising	Percentage	Areas of Specialization
Anne-Kristina Arnold	Teaching/Supervising	100% (50% appointment)	Ergonomics
Stephen Brown	Teaching/Supervising	50%	Health/Ergonomics
Anthony Leyland	Teaching	10%	Biomechanics/Ergonomics
Ryan Dill	Teaching	10%	Active Health

6. Additional Information Required by SFU:

a) Contact information for the faculty member responsible for program development

Anne-Kristina Arnold, Biomedical Physiology and Kinesiology, aarnolda@sfu.ca

Ryan Dill, Biomedical Physiology and Kinesiology, ryand@sfu.ca

Glen Tibbits, Biomedical Physiology and Kinesiology, tibbits@sfu.ca

The following would be the calendar entry for this program.

Occupational Ergonomics Certificate Program

The Occupational Ergonomics Certificate will require 24 credits, 12 of which are required, with the remaining 12 selected from a list of electives.

Admission Requirements

Admission is governed by the University's admissions regulations. After University admission, submission of a completed program approval form to the biomedical physiology & kinesiology academic advisor is required for formal acceptance in the program.

The certificate is normally completed within five years of admission to the certificate program. Units applied to one certificate may not be applied to another certificate or diploma.

Prerequisite and Required Course Grades

Students enrolling in biomedical physiology and kinesiology courses must have a grade of C- or better in prerequisite courses. Students enrolled in this certificate program must have grade of C- or better in all required courses.

Program Requirements

Students must have a minimum 2.00 grade point average (GPA) calculated on all required courses.

Students complete all of

BPK 180W Introduction to Ergonomics(3)
BPK 381 Psychology of Work(3)
BPK 481 Activity-Generated Musculoskeletal Disorders(3)*
BPK 482 Ergonomics and Rehabilitation(3)*

and four of

BPK 303 Kinanthropometry(3)
BPK 382 Workplace Health and Safety(3)
BPK 310 Exercise/Work Physiology(3)
BPK 343 Active Health: Assessment and Programming(3)
BPK 402 Mechanical Properties of Tissues(3)
BPK 415 Neural Control of Movement(3)
BPK 426 Neuromuscular Anatomy(3)
BPK 448 Rehabilitation of Movement Control(3)
BPK 484 Altitude and Aerospace Physiology(3)
BPK 496 Directed Studies I (3)[#]
BPK 498 Directed Studies II (3)[#]

* course requires additional pre-requisites

[#] course must be in area related to Occupational Ergonomics