Queen's University

Senate Committee on Academic Development
Report to Senate – Meeting of January 29, 2009

Proposal to introduce a Collaborative Master's Program in Biostatistics in the School of Graduate Studies and Research

Introduction

The proposal to introduce a Collaborative Master's Program in Biostatistics in the School of Graduate Studies and Research (SGSR) was reviewed by the Senate Committee on Academic Development (SCAD) at its meeting of November 26, 2008. B. Brouwer, Associate Dean of SGSR and D. Hunter, Graduate Education Coordinator in the Department of Community Health and Epidemiology, attended the SCAD meeting to speak to the proposal and answer questions from members of SCAD. Members of SCAD were also provided with the Program Approval Submission Form, which outlines the major components of the proposal. A copy of the proposal is attached to this report.

Analysis and Discussion

The following should be noted:

- this proposed program will be administered jointly between the Department of Community Health and Epidemiology in the Faculty of Health Sciences and the Department of Mathematics and Statistics in the Faculty of Arts and Science;
- there is a high demand in North America for qualified biostatisticians who have both analytical skills and practical experience;
- a four-month practicum will be offered to allow students the opportunity to develop consulting expertise and interpersonal skills to complement the technical learning;
- this proposed new program will not require any new resources and it will initially admit five students per year;
- Queen's ability to attract new graduate students will be enhanced by this proposed new area of study;
- graduates of this program will likely pursue careers in the fields of pharmaceutical, research, hospitals, and biological and life sciences research groups.

Conclusions/Recommendation

Recommendation:

On academic grounds, SCAD recommends that Senate approve the establishment of a Collaborative Master's Program in Biostatistics in the School of Graduate Studies and Research to commence in September 2009.

Respectfully submitted,

Patrick Deane
Chair, Senate Committee on Academic Development

Committee Members:

Members
C. Baker
J. Coates
P. Deane (Chair)
M. Hoidas
M. Lombardi
D. McKeown
K. O'Brien (Secretary)
P. Oosthuizen
M. Roberts
D. Stockley
M. Whitehead

Senate Budget Review Committee

Report to Senate – January 9, 2009

Proposal to establish a Collaborative Master's Program in Biostatistics

Introduction

On December 9, 2008, the Senate Budget Review Committee (SBRC) met to discuss the Proposal to establish Collaborative Master's Program in Biostatistics.

Analysis and Discussion

The committee was given a brief overview of the program by D. Hunter (Community Health and Epidemiology). Although the proposal stated there would be little or no impact on resources the committee's primary concerns had to do with available resources for administration staff requirements, practicum placement coordination and office space. Dr Hunter stressed the 5 additional students per year was small relative to the number of graduate students they already handle (38 MSc and 8 PhD). He thought the program could be supported by existing faculty and staff. This would include full time faculty members, tenure track teaching faculty and graduate assistants. He explained that there will be a joint program committee which will help coordinate the practicum placements but he also felt there would be excellent opportunities at both the Cancer Care and Epidemiology research group and the National Cancer Institute of Canada Clinical Trials. The introduction of the new Masters in Public Health program and subsequent move to a new location resulted in additional office space being acquired that could be used to accommodate the new Biostatistics students.

Conclusions/Recommendation

Committee was convinced that the program would have a minimal effect on existing resources and voted unanimously to recommend to Senate that they approve the Proposal Collaborative Master's Program in Biostatistics.

Respectfully submitted,

J. Medves,
Chair, Senate Budget Review Committee

Committee Members:
H. Averns
K. Brock
F. Davis
D. Hallett
J. Helland
D. Janiec
M. Koichopolos
M. Lombardi
J. Medves (Chair)
G. Willmott
I. Young

Memo

Queen's UNIVERSITY

TO Patrick Deane, Chair, SCAD
Jennifer Medves, Chair SBRC

FROM Georgina Moore, Secretary of the Senate

DATE November 19, 2008

SUBJECT Proposed Collaborative Master's Program in Biostatistics

UNIVERSITY SECRETARIAT
Mackintosh-Corry Hall, Room B400
Queen's University
Kingston, Ontario, Canada K7L 3N6
Tel 613 533-6095
Fax 613 533-2793
www.queensu.ca/secretariat

The attached proposal has been submitted to the Senate by the School of Graduate Studies and Research and is referred to SCAD and Budget Review for approval. The proposed new collaborative Master's program in Biostatistics was approved by the Faculty of Arts and Science Faculty Board in April 2008 and the Faculty of Health Sciences Faculty Board in November 2007. It was also approved by the Graduate Council on November 12, 2008 and is submitted to the Senate for approval.

Please review the proposal and report back to Senate with your committee's recommendation. Professor Duncan Hunter, Graduate Education Coordinator in Community Health & Epidemiology (ext. 74616, email hunter@queensu.ca), should be contacted if you have any questions or if you would like him to attend a committee meeting. Please contact him directly.

Thank you for your attention to this matter.

Georgina Moore
Secretary of the Senate

copy: Kathy O'Brien, Secretary, SCAD + copy of Proposal
Bob Cooke, Secretary, SBRC + copy of Proposal
Janice Deakin, Associate Vice-Principal and Dean, School of Graduate Studies and Research
Alistair MacLean, Dean, Faculty of Arts and Science
David Walker, Dean, Faculty of Health Sciences
Duncan Hunter, Department of Community Health and Epidemiology

Senate Referral File
ATT:

Senate Committee on Academic Development
and
Senate Budget Review Committee

Program Approval Submission

This form is to be used when seeking approval for all new or substantially revised programs of study leading to a degree, diploma or certificate

FACULTY/SCHOOL: School of Graduate Studies and Research

PROPOSED NEW PROGRAM: Collaborative Master's program in biostatistics (Pattern II)

PROPOSED IMPLEMENTATION DATE: September 2009

DATE OF FACULTY BOARD APPROVAL: FAS - April 2008, FHS - November 2007
November 12, 2008 Grad Council

SUBMISSION CONTACT

NAME: Duncan Hunter, Graduate Education Coordinator, Community Health

TELEPHONE: Extension: 74616

EMAIL: hunter@queensu.ca

SIGNATURE OF THE DEAN: _____ **DATE:** _____

Please note that program proposals must receive the approval of Faculty Board prior to being submitted to the Senate Office for referral to the Senate Committee on Academic Development (SCAD) and the Senate Budget Review Committee (SBRC), which will then make their recommendations to Senate.

The criteria requested in PART A should be regarded as the minimum criteria for the assessment of academic programs. Any unit planning a new program should show how not only the criteria listed below but also, where appropriate, those required by the Undergraduate Program Review Audit Committee and those of the Ministry of Training, Colleges & Universities have been taken into account. For further information, please refer to the Senate Policy "Policies and Procedures for Establishing New Undergraduate Programs". (http://www.queensu.ca/secretariat/senate/policies/newprog/index.html)

PART A

1. **OBJECTIVES:**
Please summarize the rationale for introducing this program. The program should be consistent with the Queen's mission, the academic plans of the unit including its teaching and research strengths, the relation of the unit with other academic units and the standards, educational goals and learning objectives of the degree. Explain how this program will achieve the expected academic quality. Please identify the Faculty, School of Department, which will be administratively responsible for the academic aspects of this program such as supervision of graduate students, curriculum development and the Internal Academic Review Process.

See attached sheets

2. **ADMISSION REQUIREMENTS:**
The admission requirements (preparation and achievement) should be appropriate for the learning objectives of the program and the institution to ensure the appropriate quality of student applicants. In no case should admission requirements be lower than the published minimum standards for the University. Indicators of student demand including applications, registrations, projected enrolment levels, and of the quality of students must be considered. Where admission is competitive, actual admission requirements may be higher than the published minimum standards. Information about anticipated enrolments should also be included.

Students requesting admission to the program will normally have an honours BSc degree with high standing (75% or above) in statistics, mathematics, biology, life sciences, or health sciences; and strong analytical skills. Students with English as a second language must demonstrate their English proficiency with a TOEFL score (or an equivalent) of 600 (paper)/250 (computer) or above.

3. **CURRICULUM:**
Provide a detailed overview of the proposed program, along with the proposed *Calendar* description. Details such as course requirements (core, supporting, recommended, optional courses), prerequisites, problems students may encounter and new courses being proposed for the program should be included. The structure and curriculum of the program should be appropriate for its learning objectives.

See attached sheets

4. **TEACHING:**
Briefly explain how the intended mode of delivery (including, where applicable, distance or on-line delivery) and standards of instruction for this program are appropriate to meet the program's learning objectives.

All the 8 courses are standard graduate courses regularly offered in two departments. No distance or on-line courses are required in this program.

5. EVALUATION OF STUDENT PROGRESS:
Briefly explain the intended method of evaluation of student progress and how it is appropriate for this program.

The evaluation will be based on the student's performance in course work and in the practicum. Students will be assigned a numeric grade based on evaluation of their performance on assignments and examinations. The practicum report will be examined by an Examination Committee consisting of: the supervisor(s) (non-voting member), and two internal examiners, one doubling as chair. The committee shall have at least one faculty member with a full appointment from each of the two participating Departments. The examination is to be approximately one hour of which the first 20 minutes will be devoted to an oral presentation by the candidate. The balance of time will be devoted to questioning. Students will be evaluated on a pass/fail basis.

6. EQUITY:
This program's planning, development and implementation should be consistent with the equity goals of the University and must avoid direct, indirect and systemic discrimination.

The program is developed according to the general regulations of School of Graduate Studies and Research, and any direct, indirect and systemic discrimination are avoided.

7. HUMAN RESOURCES:
Please demonstrate that the number, quality and academic expertise of the faculty in the area of the proposed program are sufficient to meet the demands of the program. Where appropriate, the availability of support staff, teaching and laboratory assistants should be indicated. (Additional details should be provided on the Resource Implications Checklist in **PART B** of this form).

The program is expected to admit 5 students each year and will be supported by existing faculty and staff. The program currently has 8 core faculty members. They are full-time faculty members in the Departments of Community Health & Epidemiology, and Mathematics and they will play a key role in this program. In addition to the core faculty members, there will be other tenure track teaching faculty in the in the M.Sc. Program who will teach elective courses. The program will be supported by the graduate assistants of both departments.

8. PHYSICAL AND INFORMATION RESOURCES:
Please provide a summary of available or required program-specific resources, such as: classroom requirements, laboratories, information technology services and facilities, and library facilities and information resources (including unique and special collections). (Additional details should be provided on the Resource Implications Checklist in **PART B** of this form).

Since this program will start with a relatively small enrollment, and the courses required are existing courses, the program will not have a substantial impact on the existing resources. Queen's University maintains the site licenses of SAS and SPSS required for this program, and no new software licenses need to be acquired. The existing laboratories, information technology services and facilities, and library facilities and information resources meet the needs of this program.

9. FINANCIAL RESOURCES:
There should be evidence of sufficient resources to introduce and maintain the program for a reasonable period of time. This should include consideration of any additional funds from internal sources and from government or other external sources as well as possible financial impact of the programs on other programs, within and outside the unit. (Additional details should be provided on the Resource Implications Checklist in **PART B** of this form).

Students in the collaborative program will be considered for funding support by their respective home program as other students in the home program. Moreover, all students will be eligible to apply for teaching assistantships in either home Department. Students conducting practicum within Queen's health research groups may receive student stipends. Students are also eligible for scholarships such as ACCELERATE Ontario - Ontario's Graduate Research Internship Program.

10. SOCIETAL CONTEXT (STUDENT DEMAND, SOCIETAL NEED, DUPLICATION):

Please provide a summary of how this program is expected to meet student demand and societal need. Evidence of student demand could include: projected enrollment levels, application statistics, origin of student demand (domestic and international), and duration of projected demand. Evidence of review and comment by appropriate student organizations should be provided. Please explain how the program will fulfill a societal need in specifically identified fields (academic, public and /or private sector) and consider the probable availability of positions on graduation, the likelihood of attracting out of province or international students and the equity implications of the program, In the case of a professional program, discuss its congruence with the regulatory requirements of the profession. Please cite similar programs offered by other institutions and provide evidence of additional societal need and/or student demand as well as indicate innovative and distinguished aspects of the program.

See attached sheets

11. LEARNING AND PROGRAM OUTCOMES:

While the aim of a university education is to produce educated individuals who possess good judgment and the capacity for critical thought, it is also important to consider specific indicators of learning and program outcomes, such as a graduation rate, length of studies, job placement, external scholarships, awards of graduating students, results of professional certification or licensing examinations, etc. Please discuss the anticipated outcomes of this program.

The normal duration of the program is 12 months. The program is anticipated to graduate 5 students each year. The demand for Master's level biostatisticians in Canada and internationally is very high, and upon completion of their studies, graduates typically find excellent employment opportunities in in places such as pharmaceutical industry, contract research organizations, regional or national centers/institutions for health research, government agencies, and universities. Some of the graduates may choose to pursue a PhD study in biostatistics.

12. OTHER ISSUES:

Please describe any additional special considerations with respect to this program.

None

PART B - RESOURCE IMPLICATIONS

1. SUMMARY OF RESOURCES REQUIRED

If you are unsure of the resource implications for any of the following, please consult with someone in the affected department or unit.

Please summarize the ***additional*** resources needed to implement the program:

a) FACULTY 0
(number of half courses)

b) STAFF 0
(number or fraction of FTEs)

c) TEACHING ASSISTANTS 0
(number of student-courses)

d) PHYSICAL FACILITIES:

Please describe the space resource implications of the proposal in terms of the following (include both size (in terms of # of students) and frequency (number of hours per week required))

1. Classrooms _____
2. Laboratories _____
3. Offices *Study spaces for 5 students in the program will be incorporated in the current space available for M.Sc. Students*

For number d) 3 above, please reallocation or reconfiguration of space is required. If so, appropriate approval must be appended.

e) INFORMATION FACILITIES

Please indicate the ITS resource implications for the proposal in terms of requirement for

1. Hardware *Not applicable*
2. Software / Internet *Not applicable*
3. Audio-Visual *Not applicable*
4. Telecommunications *Not applicable*

f) LIBRARY SERVICES

Please indicate which of following new library resources will be needed:

ρjournals
ρprint monographs
ρaudio visual material
ρhistorical documents
ρelectronic databases
ρstatistical / geospatial data

None of above

Indicate the likelihood of the program having an impact on Library staffing?

The program has no impact on library staffing due to small enrollment and existing resources

g) UNIVERSITY REGISTRAR

Please indicate the resource implications for the proposal in terms of requirement for

1. Scholarships / Bursaries *Not applicable*
2. Registration / SIS Programming *Not applicable*
3. Timetable *Not applicable*
4. Admission (Graduate / Undergraduate) *Not applicable*
5. Convocation *Not applicable*

h) OTHER UNIVERSITY SERVICES

Please indicate the resource implications for the proposal in terms of requirement for

1. Financial Services *Not applicable*
2. Human Resources *Not applicable*
3. Advancement *Not applicable*
4. Student Services *Not applicable*
5. Residences *Not applicable*
6. Other *Not applicable*

2. NEW EXPENDITURES

What new funds will be needed for each of the following? One-time $ are monies that will only be required once for startup. Base $ are funds that will continue to be needed year after year. Please attach some backup to show how the numbers were calculated.

e.g. Staff - Base $60,000 (1.5 FTE @ $40,000))

	ONE TIME $	BASE BUDGET $
FACULTY		
STAFF		
TEACHING ASSISTANTS		
STUDENT ASSISTANCE (Grad)		
OTHER NON-SALARY		
TOTAL		

3. FUNDING SOURCES

Please show the source of the **additional and/or re-allocated funds** needed for the proposal. What amount will be re-allocated from within the department's budget, from within the faculty's budget, from within the University's budget and how much will come from tuition or other sources. One-time $ are monies that will only be required once for startup. Base $ are funds that will continue to be needed year after year. The total costs in section 2 (Cost Breakdown) must match the total costs in section 3 (funding sources)

	ONE TIME $	BASE BUDGET $
DEPARTMENT BUDGET		
FACULTY BUDGET		
UNIVERSITY BUDGET		
TUITION REVENUE		
OTHER SOURCES		
TOTAL		

If other sources are used, please list the sources and indicate if the funds have been applied for and if they have been secured.

4. IMPACT ON ENROLMENT

a) How many students are expected in the program? 5

b) How many new students will the program attract to Queen's University? 5
(i.e. students in the program that are not transfers from existing programs currently being offered at Queen's)

c) How many students must be accommodated by other departments / units? 0
(Please indicate which departments / units will be affected and how.)

5. NET IMPACT OF THE PROPOSAL

Please summarize any other resource or funding implications of the proposal.

None

6. SIGN-OFF

Following Faculty Board approval, signatures from the following individuals listed below must be obtained to verify that they have reviewed this proposal. Supplementary comments may be appended and so indicated by checking the box beside the appropriate signature.

Title	Comments Appended	Signature
Department Head	ρ	
Dean or Associate Dean	ρ	
Dean of Student Affairs	ρ	
University Librarian	ρ	
Director, Information Technology Services	ρ	
University Registrar	ρ	
Associate VP (Operations & Facilities)	ρ	
Vice-Principal (Operations & Finance)	ρ	
Vice-Principal (Academic)	ρ	

Part A

1. The Master of Science Collaborative program in Biostatistics aims to meet the growing demand in Canada and the United States for qualified Master's level biostatisticians to work in academic and industry-sponsored epidemiologic and health services research. The proposed program will increase Queen's existing strengths in biostatistics and health research and provide unique opportunities for students to train within the Queen's multi-disciplinary health research environment. Through the combination of course work and practical experience, the program will stress the development of the analytical, technical and interpersonal skills required for a biostatistician to work effectively in multi-disciplinary health research environments.

   The program will be administered jointly between the Departments of Community Health & Epidemiology, Faculty of Health Sciences and Mathematics and Statistics, Faculty of Arts and Sciences and will accordingly, create research and teaching synergies between these 2 departments. It plans to admit 5 students per year and will use existing courses and faculty, so it shall not require additional resources.

3 Students will be required to complete at least 8 graduate level courses (6 core courses and 2 elective courses) in 8 months, followed by a 4-month practicum. The core courses are:

   EPID-801 Introduction to Epidemiology (Fall Term)
   EPID-823 Advanced Methods in Biostatistics (Fall Term)
   STAT-862 Computational Data Analysis (Fall Term)
   EPID-804 Advanced Epidemiologic Methods (Winter Term)
   MATH-896 Mathematical Statistics (Winter Term)
   STAT-886 Survival Analysis (Winter Term)

   The 2 elective courses will provide further training in biostatistics to prepare students for their practica, which they may choose from the offerings of either department, or from other departments, with the permission of the program director. The practicum is designed to provide students an opportunity to apply their biostatistics research and analytic skills and gain experience in consulting, communications, report writing, and teamwork, or to undertake research pertaining to some aspect of biostatistics methodological research.

   Calendar description:
   The M.Sc. Program in Biostatistics provides students with the knowledge to work in a wide variety of research, clinical and industrial settings. This program will teach graduate students both the theory and practice of observational and experimental epidemiologic designs, statistical theory, statistical models for health data analysis, and statistical computing. A 4-month practicum will allow students to apply basic knowledge and develop consulting expertise within a health research group in a university or industry setting. Through the combination of coursework and practicum experience, the program stresses the development of the analytical, technical and interpersonal skills required for a biostatistician to work effectively in multi-disciplinary health research environments and application of statistics to the biological and medical problems.

10 The demand in Canada and the United States for qualified Master's level biostatisticians in academic and industry-sponsored epidemiologic and health services research is growing fast. At Queen's University, for

example, both the Cancer Care and Epidemiology research group and the National Cancer Institute of Canada Clinical Trials Group require biostatisticians to handle data management, clinical trial design, data analysis and report writing. However, there is a shortage of biostatisticians who are adequately trained in consulting, data analysis, oral and written communication, and leadership, making it difficult for research groups in the field to recruit candidates with sufficient basic knowledge about health related research to promote effective collaboration within a multi-disciplinary health research teams. The high demand for qualified biostatisticians is also seen in the Statistical Society of Canada email list where a large number of job posts from Canadian and American employers in pharmaceutical companies, research institutes, hospitals, and biological and life science research groups in universities are for Master's level biostatisticians. At Queen's, we receive many domestic and international inquiries about studying in biostatistics each year. Many of these applicants eventually go elsewhere because of lack of Master's level biostatistics program in Queen's.

In Ontario, University of Toronto, University of Western Ontario, University of Ottawa (jointly with Carleton University) offer Master's level biostatistics programs, which are directed towards biostatistical methodology training of students rather than focusing on preparing students as professional biostatisticians demanded in job market, and are thesis based, instead of offering practical experience in health settings for students. Only the University of Waterloo provides an option for its students in the Master of Biostatistics program to have eight months of co-op training to gain working experience. The proposed collaborative program at Queen's University, through its particular resources on biostatistics training opportunities, will offer an opportunity to prepare qualified biostatisticians with adequate analytical skills and practical experience to serve in our country and world. The program will bridge the gap between the high demand of qualified biostatisticians and few universities that train biostatisticians to meet the needs of real world.

4. IMPACT ON ENROLMENT

a) How many students are expected in the program? 5

b) How many new students will the program attract to Queen's University? 5
(i.e. students in the program that are not transfers from existing programs currently being offered at Queen's)

c) How many students must be accommodated by other departments / units? 0
(Please indicate which departments / units will be affected and how.)

5. NET IMPACT OF THE PROPOSAL

Please summarize any other resource or funding implications of the proposal.

None

6. SIGN-OFF

Following Faculty Board approval, signatures from the following individuals listed below must be obtained to verify that they have reviewed this proposal. Supplementary comments may be appended and so indicated by checking the box beside the appropriate signature.

Title	Comments Appended	Signature
Department Head	ρ	Ram Mantu
Dean or Associate Dean	ρ	
Dean of Student Affairs	ρ	
University Librarian	ρ	
Director, Information Technology Services	ρ	
University Registrar	ρ	will follow-up to determine registration & degree program dates
Associate VP (Operations & Facilities)	ρ	
Vice-Principal (Operations & Finance)	ρ	
Vice-Principal (Academic)	ρ	

this page
Fax to 36015 by Nov 12
Lorraine Nees

4. IMPACT ON ENROLMENT

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Dean or Associate Dean	ρ	
Dean of Student Affairs	ρ	
University Librarian	ρ	
Director, Information Technology Services	ρ	
University Registrar	ρ	
Associate VP (Operations & Facilities)	ρ	
Vice-Principal (Operations & Finance)	ρ	
Vice-Principal (Academic)	ρ	