KINESIOLOGY:

AUGMENTED PROGRAM REVIEW, SEPTEMBER 2012

KINESIOLOGY

Review Process
This was the second undergraduate review of the Department, the first having occurred in 2005. The previous OCGS review of the graduate programs also occurred in 2004-05. The self-study for the present review was completed August 2011 as an augmented review, whereby both graduate and undergraduate programs are reviewed together. The site visit was conducted 14 and 15 March, 2011, the review team’s report was received 16 March, 2012, the Department’s response was submitted along with the Dean’s letter 30 May 2012. The final assessment report was discussed at Senate Undergraduate Council June 12 2012, at Senate Graduate and Research Council on September 2012, and included in the consent agenda of Senate in October 2012.

Characteristics of the Program

Historical Overview
Kinesiology was first offered at the University of Waterloo (UW) during the 1969-70 academic year. It was one of the first two Kinesiology programs in Canada, the other being established in the same year at Simon Fraser University. The co-op program was introduced in 1967; the MSc in 1972; and the PhD in 1974. Kinesiology also participates in two collaborative PhD programs within the Faculty, which were the subject of a separate review report earlier in 2012. Today the Department of Kinesiology is the largest of the three programs in the Faculty of Applied Health Sciences.

Program Objectives
The Department’s primary objective is to deliver programs that fit well with the University’s strategic focus on health and the prevention of disease, and with its distinctive emphasis on co-operative education. More specifically, the mission of the Department is “to optimize health and performance and prevent injury or illness through an understanding of human movement.” There are four cornerstones to the undergraduate program: biomechanics, psychomotor behavior, work physiology, and sociology of physical activity. The goal of the Department’s
undergraduate programs is to provide a broad core of interdisciplinary knowledge based on the biological, physical, mathematical, behavioural, and social sciences. At the graduate level, the three fields are biomechanics, neuroscience (previously psychomotor behavior), and physiology and nutrition (previously work physiology).

**Academic Programs Offered**

The Department offers the following programs:

- BSc Honours Co-op
- BSc Honours Co-op (Ergonomics Option)
- BSc Honours Co-op (Neurobehavioural Assessment Option)
- BSc Honours Regular
- BSc Honours (Pre-health Professions Option) (Co-op and Regular)
- BSc Four-year General
- MSc
- PhD

The Department offers 65 undergraduate courses—two below the 100 level; six at the 100 level; eight at the 200 level; 15 at the 300 level; and 34 at the 400 level. The average class size is 263 students in first year; 142 students in second year; 122 in third year; and 37 in year four.

**Students**

**Undergraduate**

The annual average number of undergraduate applicants, from 2004 to 2010 inclusive, was 895 for the co-op program and 704 for the regular program. Over the past seven years, co-op applications have gradually increased from 870 to 919, while the regular program has demonstrated a marked decline from 907 to 339 applicants.

From these applicants, the annual average number of registrations in first year, over the period 2004 to 2010 inclusive, was 54 in the regular stream and 138 in the co-op program. The applicants and registrants were predominantly domestic students with just over half being female.
The quality of the students, over the same time period, 2004-10, was quite high. Most of the students, from both co-op and regular streams, entered University with high school averages in the 80% to 85% range.

Between 2003-04 and 2004-05, roughly 100 students received first-year scholarships amounting to $100,000. However, beginning in 2006-07 the numbers doubled. This was because the University implemented an automatic average dependent scholarship that year.

Students in the General programs in the Faculty of Applied Health Sciences have the opportunity for an international exchange at Tilburg University in the Netherlands, while Kinesiology students have a specific exchange program with the School of Physiotherapy and Exercise Science at Griffith University in Australia.

Over the period 2004-05 to 2010-11 inclusive, the proportion of students in first year has been 71.5% co-op and 28.5% regular. Again, this has ranged from 54.7% co-op in 2004-05 to 88.3% in 2009-10.

Over the past five years, Winter 2006 to Fall 2010 inclusive, co-op unemployment (there are typically 100 students in co-op each term) was less than 3% in all terms except one.

Co-op students are highly evaluated by employers – 67%, over the period 2006 to 2010 inclusive, received a rating of “excellent” of “outstanding” from their employers. Likewise, 80% of students ranked their employers eight or higher on a 10-point scale where 10 was the highest evaluation.

Outside of co-op there is ample opportunity for experiential learning as many of the courses have associated laboratory requirements. Eight of the 15 core courses have laboratory experiences. There are also five practicum courses as well as courses that focus on a research apprenticeship and a research project.

Over the years 2007-08 to 2009-10 inclusive, the mean instructor and course ratings, as evaluated by students, were 4.3 and 4.2 respectively out of a possible five. However, in both instructor and course ratings there are values that were below 3.

From 2003-04 to 2009-10 inclusive, the average attrition rate from year one to year two was 7.1% with a low of 5.8% in 2003-04 and a high of 9.6% in 2006-07.
The attrition rate from the entry cohort of 1997-98 to 2003-04 to graduation within Kinesiology was 15% for students in the co-op program and 27% in the regular program. However, many of the 15% and 27% graduated from other programs in the University. The annual average number of degrees in Kinesiology granted, from 2003 to 2009 inclusive, was 144, with a high of 209 in 2007 as a result of the double cohort which entered in 2003-04. Of the 144 who graduate each year 31% are in the co-op program. Over the period 2003 to 2009 inclusive, 29.5% of graduates were on the Dean’s Honours list.

There is, at the Faculty level, an active student society known as AHSUM (Applied Health Sciences Undergraduate Members) for social activities. At the departmental level, there is student representation on the Kinesiology Undergraduate Studies Committee as well as Kinesiology’s Department Council.

Over the period 2003 to 2009 inclusive, an average of 56.6% of graduates annually entered graduate school.

Graduate

At the time the self-study was written, there were 42 Masters students, 44 doctoral students and 10 postdoctoral fellows being supervised by the core faculty.

Graduate students receive about $22,000/year in financial support on average, and doctoral students about $28,000. Average time to completion for Masters students over the last seven years has been just over 2 years, and for doctoral students around 4.7 years. All PhD graduates over the last seven years have published research papers from their thesis work, and over half of all Masters graduates.

Faculty

The Department of Kinesiology, at the time of the self-study, had a complement of 19 full-time faculty members. As a result of externally funded and bridged positions there are 23 full-time faculty members including three Canada Research Chairs and two Schlegel Research Chairs.
Over the last seven years there have been several changes in faculty members – five have retired, six have moved from UW, and one died. These positions have been replaced with 14 new faculty members.

The Department also has four cross-appointed professors from other units, three from Health Studies and Gerontology, and one from Mechanical and Mechatronics Engineering. In addition, there are currently 19 adjunct professors.

The normal teaching load is four single term courses including a seminar course at either the senior undergraduate or graduate levels. Workloads are altered for research chairs and administrative appointments.

Faculty members of the Department have received many honours. Three hold Canada Research Chairs. Six have received Early Researcher Awards from the Ministry of Research and Innovation of the Province of Ontario. Three have been recipients of the Award of Excellence in Graduate Supervision from the University, two are University Research Chairs, and one is a University Professor.

Over the past seven years, 75% of the current faculty members have served as Associate Editors, Editorial Board Members for various academic journals, membership of the Board of Directors for Research Centres, as well as invited members of review panels of the Tri-Council Granting Agencies. Virtually all faculty members are involved with national and international professional organizations such as the Canadian Society for Biomechanics, the Society for Neuroscience, the Canadian Society for Exercise Physiology, and the Canadian Society for Nutrition. Also all faculty members serve as expert reviewers evaluating on average annually 10 academic papers and six grant applications per faculty member.

The annual average research output per faculty member, over the past seven years, has been 4.5 refereed publications in top-ranked international journals and 8.5 conference presentations/abstracts for national and international meetings.

The average total funding each year for the past seven years has been in excess of $3 million, with an annual amount of over $1 million from the Tri-Councils. The annual average level of funding per faculty member has been about $160,000, ranging from $120,000 in 2003-04 to $180,000 in 2004-05.
The faculty are supported by 11.6 full-time equivalent staff, comprised of 5.1 teaching positions, 5 administrative staff, and 1.5 technical staff. At the last appraisal, the reviewers ranked the Department among the top in North America, based on the productivity of faculty and graduate students, and reputation. Departmental research was ranked in the top five in North America.

**Concerns and Opportunities for Improvement**

The review team considers that the relative youth of the faculty complement, the energy and involvement of the faculty members in the teaching of undergraduate students, the quality and extent of the experiential lab experiences, and the availability of the co-op program combine to make an excellent undergraduate Kinesiology program. At the graduate level, they felt that the Department demonstrates excellence and leadership in graduate education, on an international scale.

However there are some issues that would benefit from some consideration; there are 8 regarding the undergraduate programs, and 9 regarding the graduate programs.

**Recommendations and Responses: Undergraduate**

There was some discussion that the Department might consider calculus as a requirement for entry into the program. Such a decision might have advantages in the levels of teaching possible in some courses, particularly in the area of biomechanics.

**Recommendation 1:** That the Department find a solution to the issue of calculus requirements in the undergraduate program.

*Response:* The inclination of the Department is to continue to monitor the situation and find appropriate supports for any struggling students rather than change requirements regarding calculus at the present time.

While the performance in the calculus course deserves some consideration, challenges associated with the chemistry and physics courses pose a much greater issue. The Department has made sequencing changes to relieve some first-term pressure by separating the required physics and chemistry courses. This sequence change needs to be evaluated before addressing additional sequencing changes of core courses.
Changing the admission requirements to include high school calculus would not be prudent at this point since the Department’s admission requirements already significantly exceed those of the competition with regard to math and science requirements.

The undergraduate students interviewed were unanimous in their praise for the scope and depth of “capstone” experience courses and especially the opportunities to obtain research experience through senior thesis-type courses. A minor concern expressed was the lack of standardization with respect to evaluation criteria. While all “research-type” courses typically involve a major paper and presentation, the weight and value of these and other components is not necessarily explicitly stated. Again, this does not appear to be a major concern, but the Department may wish to consider implementing some type of general template with regards to the relative weighting of course components, similar to other course outlines.

The review team found it somewhat surprising to learn that the Department does not explicitly “showcase” the magnitude of the undergraduate student research through some sort of undergraduate student research day.

**Recommendation 2:** That the Department considers establishing an annual “undergraduate student research day” in order to “showcase” student research projects and promote the accomplishments of students involved in “capstone” experience courses.

*Response:* This is a great suggestion and will be a nice showcase for the research talent that is developed through the undergraduate program and the specific independent original research project courses. Minor Department expenses related to hosting the event portion of this suggestion will be a good investment considering the enhancement to the student experience. It is anticipated that the first “student research day” will occur in 2013-14.

The review team heard from many faculty members, staff members, and students that research and lab teaching space is very limited. An explicit concern was the fact that this shortage of research space might adversely affect the recruitment of top candidates for new faculty positions. An additional increased undergraduate complement of 20 students will add to the pressure for space, as these students will translate into additional lab groups in the courses involving labs, as well as increasing pressure on lab staff members. Collaborative use of
research space has been the usual practice, but it will not be possible to accommodate the anticipated needs of new “hires”. A suggestion was made that a faculty-wide research space audit and subsequent reassignments of space might partially resolve this issue. The Dean assured reviewers that an extensive faculty-wide space audit has been initiated.

Human resources appear to be stretched to near-limit levels, with a teaching load that includes, but does not credit, research-based courses that provide undergraduates with research experience (KIN 391, 431, 432, 433, and 472). Some recognition needs to be given to the extra time involved in teaching such courses.

The issue of the use of research equipment for experiential undergraduate labs, and the future need for more equipment for undergraduate labs as student numbers increase, was raised by several groups to the reviewers.

The reviewers were told that technical support, particularly in the IT area, has not increased despite increasing need.

**Recommendation 3:** That the Department considers attempting to provide recognition to professors who provide research experiences for undergraduate students.

*Response:* Provision of research experiences to undergraduate students is one of the variables considered in performance reviews as a determinant of the teaching merit score. Through this mechanism, credit/ recognition is given to professors who supervise undergraduate research experiences. This was clarified at an April 2012 Department Council meeting, and there was general awareness that this is clearly outlined in the annual performance review guidelines.

**Recommendation 4:** That the Department and Faculty conduct an in-depth analysis of the current and future research and teaching-lab space needs, with the generation of possible solutions.

*Response:* Requests for new space are coordinated with the Dean in order to be part of the overall Faculty space plan. The Department has pressing space needs that have resulted from real activity that has included large increases in undergraduate and graduate student enrolments and increased faculty research activity. Constructing a new addition/building for Kinesiology is the medium-term solution to this problem; shorter-term solutions would be to share space or occupy unused space on campus once identified. New construction will likely
involve a combination of allocation of infrastructure funds from the graduate growth initiative, diversion of operating funds from the Department and fund-raising initiatives.

During the Summer of 2012, the Chair will compose a building plan for a 10,000 square foot addition to accommodate teaching and research laboratory activities. The reasonable scope of this proposal shortens the expected timeline for its construction, as there may already be sufficient graduate growth incentive infrastructure funds in the Faculty to cover 50% of the anticipated cost of the project, and allow for immediate construction of the building after the project is approved by the university. This addition could be built in approximately two years.

**Recommendation 5:** That the Department and Faculty investigate potential sources of funding for the acquisition and maintenance of new, dedicated lab-teaching equipment to enhance the quality of the student experience in research-based courses.

*Response:* On a go forward basis teaching laboratory equipment maintenance and upgrades will be budgeted each year.

**Recommendation 6:** That the Department and Faculty investigate allocating a small additional pool of funds to enable staff members pursue continuing education initiatives in order to maintain and expand their skill set.

*Response:* Departmental funds have been made available for specific continuing education opportunities/professional development of staff on an *ad hoc* basis over the years. For 2012-13, the Department has requested a small budget line item specifically for this type of activity, from which funds can be allocated in response to specific requests that would be vetted by the Chair and/or the planning committee.

UW has established a goal for a student/faculty ratio of 20:1, by 2017. In Kinesiology the ratio is presently 42:1. This ratio could be reduced to 29.6:1 with the addition of eight new faculty members. This would also assist to maintain the vibrant and innovative teaching and research environment that is a defining characteristic of this Department.

**Recommendation 7:** That the University and Faculty support the Department’s request for eight new faculty positions and one staff position over the next two years.

*Response:* The Provost recently increased the faculty complement by two. This is a welcome step in the right direction, and those two positions will be filled as soon as possible.
Realistically, the next step that the Department must take is to resolve the need for teaching and research space before any further faculty complement allocations are sought. The Department must discuss how its future will fit with the planned regulation of Kinesiology as a profession under the authority of the new College of Kinesiologists of Ontario, and take the appropriate actions.

**Recommendation 8:** That the Department undertakes discussions on the implications for the Department’s future course and program offerings as a result of the impending regulation of Kinesiology as a profession in Ontario.

*Response:* The Department agrees with this suggestion, and in fact discussions on this issue began long before this review. The recent publication of the competency profile produced by the Transitional Council of the College of Kinesiologists of Ontario will need to be evaluated and an exercise will need to be conducted in order to map these competencies onto the existing curriculum. If there are deficiencies in the current curriculum they will need to be addressed by offering new experiences/courses. Activities to address these issues will be a major focus of the undergraduate committee over the 2011-13 academic year, with a recommendation for implementation in 2013-14.

**Recommendations and Responses: Graduate**

**G-1.** That the Department consider clarifying/refining the stated objectives of the MSc and PhD programs, with the view to harmonizing the wording with the objectives of the Department and the University as a whole;

**G-2.** That the Department be permitted to change the name of the field of study from “work Physiology” to “Physiology and Nutrition”;

**G-3.** That the Department address the issue of Kin 631, in order to ensure appropriate statistical training for graduate students in Kinesiology;

**G-4.** That the Department consider attempting to provide recognition to professors who provide research experiences for UG students;
G-5. That the Department and Faculty conduct an in-depth analysis of the current and future research and teaching-lab space needs, with the generation of possible solutions that might include the rental and/or construction of facilities;

G-6. That the Department and Faculty investigate potential sources of funding for the acquisition and maintenance of new, dedicated lab-teaching equipment in order to enhance the quality of the student experience in research-based courses;

G-7. That the Department and Faculty consider allocating a pool of funds to enable staff to pursue continued education initiatives in order to maintain and expand their skill set;

G-8. That the Department increase technical support in the IT area for departmental researchers; and

G-9. That the department obtain tracking data on the employment/further education outcomes of the masters and doctoral students.

The Department responded as follows (summarized from the original):

G-1. The Department agrees to produce a new harmonized statement of objectives for the two graduate programs, for approval Fall 2012.

G-2. The changed field name was approved by Senate May 2012.

G-3. The Department has assigned the statistics course to a new faculty member, who will teach it first in Winter 2014 (since she has course reliefs in academic year 2012-2013).

G-4. The Department does include supervision of undergraduate research projects in faculty performance evaluations, and provides a modest fund ($50/project) to support lab costs for these projects. The Department will add a description of availability of these funds, to the application forms for the research project courses, starting in fall 2012.

G-5. The Dean is engaged in examining the possibilities for additional space in the short run. The Chair is developing a building plan for a ten thousand square foot addition to the current building. In the next two years, planning and fundraising will occur, for this more medium-long term solution.
G-6. In the past, teaching laboratory needs were funded from carryforward. With the new budget model, these will be included as an ongoing budget line, and a process of identifying priority items has been put in place.

G-7. In the past, staff development activities have been funded on an ad-hoc basis. The new budget model will provide a budget line for this purpose, and the Department will institute a procedure for application for these funds by staff.

G-8. The Department has an unfilled technical staff position, left vacant due to budget cuts in 2010. In fall 2012, the Department plans to strike a small committee to develop a job description, which can then be submitted to the Provost for mission critical approval.

G-9. The tracking of employment of graduates will be explored by the Associate Chair, Graduate Studies, to either use an existing mechanism, or to see what it would take to develop a mechanism for tracking this information.

Two-Year Implementation Plan

The Department will provide a report to Senate Graduate and Research Council on the progress in response to these recommendations. At the undergraduate level, progress on recommendations 2, 4, 5, 6 and 8 is expected by September 2014, and at the graduate level with respect to all except recommendation G-5 (additional space); although planning with respect to space will occur, it seems unlikely that a new building will be in place at that point.