EP.08.38
(Rev. 3/10/08)

PROPOSAL TO THE SENATE COMMITTEE ON EDUCATIONAL POLICY

TITLE: Proposal to Create a Professional Science Master's Graduate Concentration in the Graduate College

SPONSOR: Kevin Sightler, Ph.D.
Director, Office of Professional Science Master's Programs (OPSM)
Graduate College
226 Coble Hall, MC-322
801 South Wright Street
Champaign, Illinois 61820

BRIEF DESCRIPTION:

The Graduate College seeks to establish a new graduate concentration titled '**Professional Science Master's**' for the purposes of establishing a campus-wide PSM program in collaboration with multiple disciplinary units across campus. **The Professional Science Master's (PSM) is an innovative, new graduate program designed to enable students to pursue advanced training in science, technology, engineering or mathematics, while simultaneously developing workplace skills highly valued by employers.** Supported by funding from the Alfred P. Sloan Foundation, this effort responds to the *Strategic Plan for Illinois* wherein PSMs are identified as novel, priority programs in support of several strategic initiatives. The *Illinois* PSM Initiative intends to launch programs within 10 disciplines over the first three years with inaugural programs in Agricultural Production, Bioenergy, and Food Science and Human Nutrition. PSM programs consist of approximately 18 months of academic training in a scientific discipline, combined with a professional component that includes internships and "cross-training" in business fundamentals. The proposed PSM curriculum, outlined in details in **Appendix A**, requires 42 semester hours of course work, with 32 hours in the major discipline and 10 hours in business-related professional content. The proposed sequencing of courses is outlined in **Appendix B**. The PSM concentration will be available for coupling with disciplinary majors within non-thesis M.S. degree programs that have undergone a feasibility assessment by the Graduate College to establish program need and viability, and entered into a Memorandum of Understanding with the Graduate College for the proposed program.

Students completing the proposed curriculum within the PSM programs will receive a Masters of Science (M.S.) degree with a disciplinary major and PSM concentration, as follows:

Degree: M.S.
Major: Specific science discipline (initially Food Science and Human Nutrition, Agricultural Production or Bioenergy)
Concentration: Professional Science Master's

Initial disciplines involved include Food Science and Human Nutrition (an existing non-thesis major), Agricultural Production and Bioenergy, with the latter two majors currently undergoing the review and approval process. All future programs added to this program will be done so with approval of the Faculty Senate and all levels of governance required by the University of Illinois at Urbana-Champaign.

The Graduate College seeks to launch the *Illinois* PSM Initiative in Fall 2009. These programs have been designed as a revenue-generating, three-semester, non-thesis M.S. degree, wherein students will not be eligible for receipt of a Tuition and/or Fee Waiver. Greater than 90 % of tuition will be distributed back to the participating units providing the PSM courses (on a credit hour basis) and advising based on a Memorandum of Understanding that will be established with all participating units prior to launching any program. Student enrollment targets for this program are conservative with 5 students expected in Year 1, 8 students expected in Year 2 and 10 students expected in Year 3 within each discipline. Therefore, upon reaching capacity, a maximum of 20 students will be enrolled in each disciplinary program at any one time, resulting in 200 students within 10 disciplinary programs across campus.

The Graduate College has recently established the Office of Professional Science Masters (OPSM), under the direction of Director Kevin Sightler, and will be responsible for coordinating admissions and career services for PSM students; however, as with all graduate programs, the final admission decision will be made at the disciplinary program level. Students will not be eligible to transfer graduate credit into programs offered in combination with the PSM Concentration to ensure the revenue-generating nature of this cohort program.

Student advising services will be provided in three ways. First, student advisors within the relevant discipline will be responsible for student advising relative to disciplinary major portion of their program. Secondly, the OPSM will advise students about issues relating to the 'PSM concentration requirements' including ensuring adequate opportunities for the required internship exist. Finally, the Graduate College also provides career advising for students through its Career Services Office that assists students in finding full-time positions upon graduation.

An overall ***Illinois* PSM Advisory Board** is under establishment and will be composed of faculty, students and key industry representatives from major corporations in the state and region, professional organizations, and civic leadership. In addition, each discipline-based PSM degree program will have its own External Advisory Committee. These committees are already in place in most units and serve to provide oversight for all degree programs and activities of that unit. The OPSM will provide guidelines for evaluating the PSM to these committees, but each unit providing the discipline-based instruction will have considerable freedom in establishing the composition and function of these committees. Most of these units already have strong connections with industry, and each will use their External Advisory Committee to plan and assess the PSM design and to consolidate and strengthen those existing ties to corporate partners. Committees are expected to provide opportunities to establish internships for PSM students.

JUSTIFICATION:

Approximately 130 PSM programs are currently offered nationwide in a wide range of disciplines such as industrial microbiology (Michigan), human-computer interaction (Georgia Tech), computational chemistry (Michigan State), and nanoscale physics (Rice). The Council of Graduate Schools (CGS) actively promotes PSM programming and the Alfred P. Sloan Foundation financially supports PSM development, including both planning and implementation grants to *Illinois*. Disciplinary concentrations within the PSM programs at *Illinois* will be developed and delivered in units with distinguished research records. They will serve the needs of industry and government by providing state-of-the-art education in science and technology for masters level students seeking

science, technology, engineering and mathematics careers, combining their disciplinary training with skills and knowledge our graduates will need in the professional workplace. Further, we strive to provide leadership within large public research institutions by creating a successful model for the broad implementation of a centrally administered PSM program that is embraced as a fundamental approach to graduate education that augments the strong traditional portfolio of degrees offered.

Our work-to-date on this initiative has included surveying the perceived need and commitment to the PSM philosophy and for the development of such programs at *Illinois*. Initial efforts targeted the highest levels of institutional leaders and resulted in a specific call for the development of PSM programs in areas of pressing needs within our campus' strategic plan. Strong support has also been obtained from *Illinois* faculty and administrators from a variety of disciplines across the campus. To develop an understanding of the level of interest in a PSM program beyond our *Illinois* faculty and administrators, potential customers were surveyed via a single email requesting users complete a survey regarding the PSM on SurveyMonkey.com during the summer of 2007. Tailored surveys were sent to: 1) potential students (current and recently degree recipients from science and technology undergraduate programs, and graduates of the Certificate in Business Administration for Scientists course) and; 2) potential corporate partners. A summary of the results obtained, demonstrating strong support among these stakeholders, is found in **Table 1**.

Table 1. Summary of Results from Potential Student and Corporate Partner Survey

Potential Students (203 completed survey; estimated response rate of 25 %)	
95% undergraduates, aged 18 to 22 years	
90% highly interested in PSM program	
57% remain interested even if TA/RA positions are unavailable	
Corporate partners (21 completed surveys; response rate of 20.6 %)	
64% are unfamiliar with a PSM degree	
88% are interested in PSM students	
65% interested in providing scholarships	
73% interested in sponsoring student projects	
Top skills in demand (based on Corporate Partners responses)	
Leadership	Quantitative problem solving
Interpersonal communication skills	Project management
Ethics	Field experience
Top fields in demand (based on responses from both potential student and Corporate Partners surveys)	
Industrial and enterprise systems engineering	Aerospace engineering
Bioenergy	Environmental sciences
Computer science	Chemistry

In summary, data obtained from university administrators, on-campus disciplinary units, potential students and external corporate partners consistently indicate the feasibility of a centrally-administered, campus-wide, sustainable PSM program as a societally-relevant adjuvant to the traditional portfolio of degrees offered at *Illinois*.

BUDGETARY AND STAFF IMPLICATIONS:

a. Additional staff and dollars needed
A concentration of this size and scope requires an office to establish and coordinate all PSM degree programs and to be responsible for administration and coordination of the programs across each of the individual participating units within the institution. For this purpose, the Office of Professional Science Master's (OPSM) has been created within the Graduate College. Specifically, this office will be responsible for program administration, student advising, marketing, advertising, course development and maintenance, and career services. However, OPSM will not re-create services already provided at *Illinois*. Instead it will work to leverage the existing channels for course development and maintenance, advising, admissions, career services, marketing and advertising already in place on campus and at the Graduate College. In addition, the disciplinary programs will be responsible for student advising relative to courses in the discipline.

Funding for the Director of PSM position has been provided by a grant from the Sloan Foundation for three years. As demands on the office increase, however, OPSM services will be increased proportionately, and as the PSM program matures, an additional Career Services Advisor is likely to be necessary. The funding plan has been established to allow for increased personnel to support these additional students as the program grows. In addition, the financial plan projects a three-year breakeven point and revenue generation (having recouped initial Graduate College investments) in about 4-1/2 years. Students in this program will not be eligible for tuition waivers.

b. Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.)
Graduate College resources will be utilized to support the OPSM, including office space, utilities, equipment, supplies, and staff including leadership, secretarial, finance, communications and marketing, and support.

c. Effect on course enrollment in other departments and explanations of discussions with representatives of those departments
The professional business and managerial courses will be provided by the College of Business and the Institute for Labor and Industrial Relations. Both units have committed to working with OPSM to develop and deliver the PSM business fundamentals courses. With a projected total enrollment of about 200 students across 10 programs within three years, the impact on enrollments will be material. The Graduate College is currently negotiating the financial arrangements with these two units to make their participation possible. Evidence of support from both Business and ILIR is included in Appendix C.

d. Impact on library, computer use, laboratory use, equipment, etc.
Although each student and faculty impact the services provided by the library, the proposed program will rely on resources used in existing programs and therefore there is no need to expand the collections currently present within the library.

GUIDELINES FOR UNDERGRADUATE EDUCATION: Not applicable

EFFECTIVE DATE: Upon approval.

CLEARANCES:

Dean, Graduate College — Date: 1/28/08

Provost, Graduate College — Date

Chair, Senate Committee on Educational Policy — Date

STATEMENT FOR PROGRAMS OF STUDY CATALOG:

Professional Science Master's

Web address TBA

Director: Dr. Kevin Sightler
Office of Professional Science Master's Programs (OPSM)
Graduate College
226 Coble Hall, 801 South Wright Street
Champaign, Illinois 61820
Email: TBA

Graduate Concentration: Professional Science Master's

Graduate Degree Program

The concentration in Professional Science Master's (PSM) provides masters students with a unique learning experience by combining traditional science, technology, engineering and mathematics disciplines with an integrated professional curriculum focusing on core business fundamentals. Traditional depth in the disciplinary field coupled with business-related workplace skills and real-world internship experience allows graduates to step into entry-level careers in business, government, and non-profit employment sectors without pursing the doctorate. These programs are full-time and cohort-based with a prescribed curriculum that is normally completed within 18 months.

Professional Science Master's concentrations are available in the following programs:

M.S. in Agricultural Production
M.S. in Bioenergy
M.S. in Food Science and Human Nutrition

Admission

Candidates for admission to the concentration and the associated M.S. degree must have a bachelor's degree from an accredited institution equivalent to those from the University of Illinois at Urbana-Champaign. Minimum requirements include a grade point average of 3.0 or higher (A = 4.0) for the last 60 hours of undergraduate work and for any graduate study is required for admission. Graduate Record Examination (GRE) scores are required of all applicants and the minimum acceptable Test of English as a Foreign Language (TOEFL) score is 590 on the paper-based test or 243 on the computer-based test. Admission to one of the eligible degree programs listed above is required, and their admission requirements vary by program and may be more rigorous than the minimums presented here. Transfer credit may not be applied to this program due to the cohort nature of this program.

Degree Requirements – Graduate Concentration

Specific requirements vary by major degree program, but all programs require a minimum total of 42 graduate hours of work in three areas: a scientific discipline (may include related interdisciplinary fields), business and management fundamentals, and an internship.

To complete the PSM Concentration, students must complete a minimum of 42 hours of graduate credit, including:

- 32 credits hours within the disciplinary major, as indicated by the specific program;
- 10 credit hours of business and management fundamentals courses (outlined below), and;
- a 12-week Internship after the first year of study (0 hr).

The 10 credit hours of business and management fundamentals include mandatory enrollment in:

- Industry Seminar Series during the first two semesters of the program (0 hr) with presentation in the Industry Seminar Series during the third semester (1 hr);
- Corporate Communications (1 hr);
- Bridging Science and Commerce (2 hr);
- Managerial Accounting and Financial Management (2 hr).

In addition, four hours must be selected from the following course list:**

- Human Resource Fundamentals for Scientists and Engineers (2 hr);
- Entrepreneurship and Technology Management (2 hr);
- Marketing and Strategic Decision-Making (2 hr).

** Additional courses may be added

Students will not be eligible to transfer graduate credit into this major. See individual program pages for specific details of disciplinary requirements.

Facilities and Resources

PSM business fundamentals courses are developed and taught by University of Illinois College of Business and Institute for Labor and Industrial Relations faculty. Both of these programs are national leaders in their fields and know what employers need in new graduates. In the disciplinary fields, tenure-system faculty teach and advise students in their PSM programs, and students are housed in academic departments on the Urbana-Champaign campus. In addition, the Office of Professional Science Master's (OPSM) advises PSM students with regard to PSM business fundamentals courses, coordinates industry internships, and provides Career Services.

Financial Aid

Financial aid in the form of fellowships, teaching and research assistantships, or tuition and fee waivers are not available for graduate students in this program.

Full proposal available for review in the Senate Office.