APPROVED BY SENATE
02/04/2013

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ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Establish a New Major Leading to a Masters of Science in Plant Biotechnology in Conjunction with a Professional Science Master's Concentration within the Department of Plant Biology, College of LAS

SPONSOR: Feng Sheng Hu, Professor and Head, Department of Plant Biology, 244-2982, fshu@life.illinois.edu.

COLLEGE CONTACT: Karen Carney, Associate Dean, LAS, 333-350,kmcarney@illinois.edu

BRIEF DESCRIPTION: The Department of Plant Biology proposes to create a new graduate major, **Plant Biotechnology,** in fulfillment of the requirements of an MS degree that will be available exclusively in conjunction with the **Illinois Professional Science Master's Concentration (PSM).** Together, the new major in Plant Biotechnology and the PSM Concentration will comprise the graduate degree program: **Illinois PSM in Plant Biotechnology.** The Department currently offers a PSM concentration in conjunction with its existing Master's of Science (MS) in Plant Biology named: Illinois PSM in Plant Biology. In a concurrent proposal, we are seeking to terminate this existing Illinois PSM in Plant Biology, pending approval of the proposed Plant Biotechnology major. Moreover, if approved, students currently enrolled in the Illinois PSM in Plant Biology will be advised of the requirements for the proposed Illinois PSM in Plant Biotechnology and offered the option of selecting the new major in Plant Biotechnology prior to their graduation.

The proposed new major in Plant Biotechnology will provide the graduate science scholarship required for the Illinois PSM in Plant Biotechnology program and will be jointly administered by the Department of Plant Biology and the Illinois Professional Science Master's (PSM) program, a unit of the Graduate College. The new Illinois PSM in Plant Biotechnology will primarily serve students seeking a terminal master's degree (i.e., not necessarily en route to the doctorate) as enhanced preparation for careers in plant biotechnology that call for both science- and business-related skills and responsibilities. The program will be a three-semester, one summer term, non-thesis, self-supporting MS degree program and require a minimum of 42 credit hours total: 32 hours of primarily plant-based biotechnology curriculum, of which 9 hours of biotechnology core courses are required as specified in Appendix A, and 10 hours of courses in the PSM concentration. In addition, students will be required to take 3 semesters of a PSM

industry seminar series, and fulfill an internship (Appendix A). The biotechnology focus of our graduate degree program is closely linked to the chief interests of our industry partners and key employment opportunities for our graduates. The Illinois PSM in Plant Biotechnology should be particularly attractive to students seeking mid-level management positions in agricultural, medical, or environmental technology organizations, where they may serve as project managers in areas such as intellectual property, regulatory affairs, product development and marketing. Financial assistance in the form of full or partial waiver of tuition and fees will not be available (except for statutory waivers).

JUSTIFICATION: The proposed major in Plant Biotechnology will be an interdisciplinary training program that spans fundamental and applied aspects of the science. A biotechnology-based foundation is already evident in our existing Illinois PSM in Plant Biology program, albeit in an elective form. However, our proposed curriculum for a new major in Plant Biotechnology presents a clearly defined biotechnology theme that requires students to complete a core set of biotechnology-based courses and strongly encourages technology-based experiential learning (e.g. research). This is evidenced by the list of required courses and approved science electives for the Illinois PSM in Plant Biotechnology (Appendix A), which emphasizes relevant disciplines such as genetics and genomics, proteomics, metabolomics, molecular biology and biochemistry. We intend to incorporate additional courses during AY 2013-2014 that will enhance the biotechnology foundation, including a new 500-level course in the School of Integrative Biology, **IB 503 Methods/Applications in Biotechnology.** This course aims to provide students with a working knowledge of the methods behind key technologies in the biological sciences as well as practice in their application to experimental questions and exposure to hands-on demonstrations with University of Illinois experts in the area.

In addition to the core biotechnology curriculum, students in the Illinois PSM in Plant Biotechnology will encounter experiential learning targeted to the biotechnology realm. This will include a biotechnology-related internship experience as well as optional industry-relevant research conducted for the duration of their graduate studies on campus. For students who select this, their graduate-level research experience will be encouraged and mentored closely, in some cases entailing projects developed in direct collaboration with biotechnology industry partners and based on studies of concrete interest to our collaborators. In consultation with the PSM in Plant Biotechnology program coordinator and faculty advisor, students may substitute alternative graduate-level experiences that similarly offer tangible ties with non-academic career outcomes. Examples include membership and significant responsibilities in professional organizations or industry co-op positions that extend into the FA/SP academic year. Throughout the PSM in Plant Biotechnology program, the prongs of coursework, research or professional endeavors and internship experience will merge in the Biotechnology section of IB 510 Discussions in Plant Biology seminar classes in ways that facilitate connections between scholarship in the discipline and the needs and trends of biotechnology industries. The new major in Plant Biotechnology will offer a flexible science curriculum tailored to each student's interests and may include additional courses in the biological sciences selected in

consultation with the PSM program coordinator and faculty advisor. A detailed comparison of the current graduate major in Plant Biology and the proposed major in Plant Biotechnology is shown in Appendix B.

By coupling sound, graduate-level science scholarship and practical skills with the professional business content that includes technology and innovation management, accounting and finance, project management, marketing and global strategy of the Illinois PSM concentration, students in the Illinois PSM in Plant Biotechnology will be prepared to take on responsibilities at the interface of science and business. Graduate candidates who gain interdisciplinary graduate-level expertise in biotechnology and well-defined links to industry needs will be positioned to successfully follow career tracks in these sectors. With sustained, direct ties to the technology-based sector, the Illinois PSM in Plant Biotechnology will produce students who bridge the transition from academia to industry. A detailed description of the Illinois PSM concentration is presented in Appendix C.

To successfully publicize the blended plant biotechnology focus of our major and the PSM concentration to faculty and prospective students throughout the university community as well as to private sector partners and potential employers, it is essential that our promotional materials clearly communicate our core technology focus. The extent to which the name of our graduate program reflects our mission is pivotal in our efforts to recruit both students and industry partners. Throughout the Spring 2011 semester, intensive, in-person student recruitment for the existing Illinois PSM in Plant Biology was conducted at both the University of Illinois and other Midwest institutions. This campaign demonstrated that, while the term "biotechnology" accurately conveys our curricular emphasis and the industries for which our degree provides preparation, the word "biology" does not. Hence, it is imperative that our program name readily describes the nature of our degree.

Convincing evidence that a biotechnology major and PSM concentration are of interest to prospective students in life science programs was acquired through a 2009 market interest survey conducted by the Department of Plant Biology in collaboration with Illinois Business Consulting (IBC). The survey and summary of results are in Attachment 1. Note that the original questionnaire surveyed interest in a "PSM in Biotechnology" and thus is directly relevant to this program proposal. Nationwide, there are now 35 Professional Science Master's programs formally identified by the Council of Graduate Schools (CGS) as biotechnology-based PSM programs at colleges and universities. In June 2011, our Illinois PSM in Plant Biology was approved by the CGS PSM community (www.sciencemasters.com). Of note is the fact that our proposed broad-based **Illinois PSM in Plant Biotechnology** curriculum and our opportunities for industry-linked research projects is relatively unique and will serve to distinguish our program from among the biotechnology PSM programs nationwide.

We propose that a new graduate major in **Plant Biotechnology** in conjunction with the **Illinois Professional Science Master's concentration** will lead to an **Illinois PSM in**

Plant Biotechnology that reflects the strengths of the plant sciences at Illinois and uniquely serves the needs of students and potential employers.

BUDGETARY AND STAFF IMPLICATIONS: (Please respond to each of the following questions. Place your response right after each item. See Appendix D for additional information.).

a. Additional staff and dollars needed. The proposed graduate major, Plant Biotechnology, will be offered only in conjunction with the PSM concentration and is intended to generate sufficient new revenue from tuition to meet its operating costs. The program will support a program coordinator who oversees ongoing program and curriculum development, recruits students, instructs, advises, develops research projects and industry partnerships and provides individualized mentoring for the graduate students. The current PSM in Plant Biology, which commenced its first cohort in Fall 2011, supports a program coordinator, whose responsibilities will be transferred to the new Illinois PSM in Plant Biotechnology once the new major is established and the current Illinois PSM in Plant Biology is terminated. The current program maximum of 10-15 students will remain unchanged. Hence, no additional funds for the PSM in Plant Biotechnology will be required. The program coordinator of the PSM in Plant Biology is an Academic Professional, currently funded with 3 years of salary support from the College of Liberal Arts and Sciences and the School of Integrative Biology to facilitate the establishment of a successful PSM concentration in the Department of Plant Biology. If the Department continues to offer a PSM degree after this initial period, the program coordinator position will be funded with tuition revenue or other Departmental support. At current tuition and fee rates, breakeven enrollment to cover this cost is six students. For estimated enrollment and revenue projections, refer to Attachment 2. The program coordinator functions in collaboration with a steering committee composed of three faculty members in the Plant Biology Department. It is anticipated that existing secretarial and administrative staff in the Plant Biology Department and School of Integrative Biology offices will be able to handle the extra work load from this program.
b. Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.) It is anticipated that a maximum of 10-15 Illinois PSM in Plant Biotechnology students will be in the program at any given time once steady state is reached (approximately three years). The current core courses that will be required of these students have been approved and staffed, but new courses may be considered as the program develops, at which time tuition revenue from the Illinois PSM program will be used as needed to fund the continued growth of the program. Average enrollment in the integrative biology (IB) courses in the proposed curriculum has been 12 students (AY 06-AY 11); the School of Integrative Biology has indicated that the additional enrollments of up to 15 PSM students can be accommodated without adding more course sections.
c. Effect on course enrollment in other units and explanations of discussions with representatives of those departments. Student enrollment targets for the PSM

program are optimistically estimated at 5-8 students each year. Therefore, within three years, we anticipate 10-15 students in the PSM Concentration. As with internal reallocations, the relatively low numbers, and the fact that most of the courses required in this new program are within our department, will result in minimal impact. The impact on individual courses in specific semesters is likely to be a few students, at most. The other unit delivering instruction for this program is the Department of Crop Sciences (CPSC). Average enrollment in the CPSC courses in the proposed curriculum is 46 students (AY 06-AY 10). The department has indicated that it can accommodate increased enrollments from students in the proposed program at no marginal cost (see department chair's letter of support in Appendix E).

d. Impact on the University Library, computer use, laboratory use, equipment, etc. A letter of endorsement from University Librarian Paula Kaufman is attached to this proposal (Appendix E).
e. Impact on computer use, laboratory use, equipment, etc. Given that we expect the growth in the new program to be gradual for the first few years as it becomes established, the impact on resource requirements will be minimal. As numbers increase, the revenue generated as a result of the PSM component of the program will support any required additional resources.

DESIRED EFFECTIVE DATE: Fall 2013

STATEMENT FOR PROGRAMS OF STUDY CATALOG:

Plant Biology

www.life.illinois.edu/plantbio/index.html

Head of the Department: Feng Sheng Hu
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Major: Plant Biology
Degrees Offered: M.S., Ph.D.

Major: Plant Biotechnology
Degree Offered: M.S.
Graduate Concentration: Professional Science Master's

Graduate Degree Programs

The Department of Plant Biology offers three graduate programs leading to the Master of Science degrees (thesis and non-thesis MS options in Plant Biology, and the non-thesis Professional Science Master's (PSM) concentration in Plant Biotechnology) and a Doctor of Philosophy degree. It also participates in two interdepartmental programs leading to a doctoral degree: Program in Physiological and Molecular Plant Biology, and the Program in Ecology, Evolution and Conservation Biology. In addition, students can participate, during their degree programs, in several non-degree granting interdepartmental programs and interest groups, such as the Cell and Molecular Biology Training Program and the Systematics and Biodiversity Group.

The Department teaches and conducts research in basic plant biology. Its focus is integrative: biological processes are investigated at multiple levels of organization using molecular, biochemical, physiological, and ecological approaches. Areas of specialization within the department include biochemistry, biodiversity, bioinformatics, cell biology, conservation biology, development, ecology, environmental physiology, evolution, genetics, genomics, modeling, molecular biology, mycology, paleoecology, photosynthesis, phytochemistry, population biology, biotechnology, systems biology and systematics. Graduate students acquire reasonable breadth in their overall biological and professional training as well as expert-level depth in their areas of specialization. Students in the Illinois PSM in Plant Biotechnology program emphasize plant-related disciplines that support biotechnological areas, including genetics, genomics, biochemistry, physiology and cell and molecular biology.

The Plant Biology Departmental website (www.life.uiuc.edu/plantbio) provides additional information about the department, its admissions procedures, degree requirements, facilities, and the research interests of its faculty. The Professional Science Master's in Plant Biotechnology website (www.life.uiuc.edu/plantbio/psm) provides information about the PSM requirements and industry linkages.

Admission

Prospective students for thesis-option graduate studies in Plant Biology are encouraged to identify faculty member(s) whose research specialty(ies) most closely coincide(s) with their interests and to correspond directly with them. Acceptance for thesis degrees is based on the applicant's academic achievement and research potential. Acceptance for the non-thesis option in Plant Biology is based on the applicant's academic achievement. Admission into the Plant Biotechnology program and PSM concentration is based on the applicant's academic achievement and expressed interest in non-academic careers that blend science and business. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had an undergraduate degree in biology or related sciences. Admission to the graduate program requires an undergraduate grade point average of at least 3.0 (A = 4.0). Graduate Record Examination (GRE) scores (or approved equivalent) are required; however no minimum scores are specified for admission. An advanced subject test is recommended. International students should have a Test of English as a Foreign Language (TOEFL) score of 600 or above on the paper-based test, or 250 or above on the computer-based test (cBT) or 102 or above on the internet-based test (iBT).

Degree Requirements

For additional details and requirements, please refer to the Plant Biology Department's online Graduate Handbook and the University's Graduate College Handbook.

Master of Science, Plant Biology

Required Courses:	Plant Biology Thesis option - Required Hours	Plant Biology Non-thesis option - Required Hours
Course hours distributed among three of the following areas: anatomy, biochemistry, development, ecology, evolution, genetics, molecular biology, physiology, and systematics (4 of these hours must be outside the immediate	12	12

research interests of the student)		
Individual Topics, IB 590 (min/max applied toward degree):		max 8
Language Requirement:	Discretion of advisor	Discretion of advisor
Thesis Hours Required (min/max applied toward degree):	max 8	N/A
Total Hours	32	32
Minimum 500-level Hours Required Overall:	12	12
Other Requirements:		
Minimum GPA:	3.0	3.0

Plant Biology Thesis option: The requirement of a thesis for the M.S. degree in Plant Biology is determined in consultation with the candidate's adviser. The program is normally completed within two years. Candidates are expected to complete at least 32 semester hours of graduate coursework and research agreed upon with a faculty adviser.

Master of Science, Plant Biotechnology

Required Courses:	**Illinois PSM in Plant Biotechnology:** **Plant Biotech (non-thesis) + PSM Concentration**
Science electives selected in consultation with advisor; For required courses see: life.uiuc.edu/plantbio/psm	23
IB 510 Disc. in Plant Biology; Biotechnology section (3 semesters)	3
Individual Topics, IB 590 (min/max applied toward degree):	max 6 (optional)
Language Requirement:	Discretion of advisor
IB 474 Plant Proteomics-Metabolomics	2
IB 473 Plant Genomics	1
IB 503 Applications/Methods in Biotechnology	3
PSM Concentration Courses	10

Internship PSM 555	0 min.
PSM Seminar (PSM 501, 502, 503)*	0 min.
Thesis Hours Required (min/max applied toward degree):	N/A
Total Hours	42 min
Minimum 500-level Hours Required Overall:	12
Other Requirements:	Students must enroll full-time (i.e., 12 or more hours) in fall and spring terms.
Minimum GPA:	3.0

*** Students can opt to take the PSM seminar series for 0 credit (pass/fail) or 1 credit hour (letter grade). Credit hours for these courses do not apply towards either the 32 science hours or 10 business hours required for the degree.**

The Illinois PSM in Plant Biotechnology: The program is completed in 16 months, consisting of 3 full-time, on-campus semesters and a summer internship. Enrollment in PSM 555 is required in the summer term during which the internship is completed; PSM-specific summer tuition is assessed. PSM students are encouraged to conduct non-thesis research or other approved extracurricular experiences for which they may receive a maximum of 6 semester hours of IB 590 Individual Topics. The minimum 42 credit hour curriculum is determined in consultation with the candidate's adviser. Candidates are expected to complete at least 32 semester hours of approved Plant Biotechnology science coursework (including IB 590 credit hours, if applicable) and 10 semester hours of required business courses.

Doctor of Philosophy

No change

Facilities and Resources

The Plant Biology Department's diverse state-of-the-art research laboratories are located in Morrill Hall, Edward R. Madigan Laboratory and the Institute for Genomic Biology. In addition, the Department maintains extensive plant growth-chamber facilities, environmentally controlled greenhouses, a conservatory with live teaching and research collections, herbaria, a center for paleobotanical collections and diverse local and remote field sites including SoyFACE. The University also offers exceptional research support services including the Roy J. Carver Biotechnology Center, service laboratories in the Institute for Genomic Biology and the Beckman Institute and the University Library, one of the world's largest.

Financial Aid

Fellowships, teaching assistantships, and research assistantships are available for qualified MS and PhD students in Plant Biology. Fellowships in these programs are awarded on a competitive basis. Illinois PSM students may not hold assistantships or other tuition and fee waiver-generating appointments; statutory waivers and tuition scholarships are accepted.

CLEARANCES: *(Clearances should include signatures and dates of approval) - - These signatures must appear on a separate sheet. If multiple departments or colleges, add lines.)*

Signatures:

6/18/12

Unit Representative: Date:

6/29/12

College Representative: Date:

12/14/12

Graduate College Representative: Date:

School. Integrative Biology

Appendix A:

Proposed Sequencing for the Illinois PSM in Plant Biotechnology. Required courses are shown in bold; others are approved elective courses. In consultation with the program coordinator and/or faculty advisor, students may select from these electives or other courses not listed here.

Year 1

Fall Semester :

Plant Biotechnology coursework: 10 – 12 credit hours

- IB 472 Plant Molecular Biology (1)
- **IB 473 Plant Genomics (1)**
- **IB 474 Plant Proteomics -Metabolomics (2)**
- CPSC 440 Statistics (4)
- IB 425 Plant Secondary Metabolism (3)
- IB 477 Genomics for Crop Improvement (2)
- IB 513 Discussions in Plant Physiology (1)
- CPSC 452 Evol. Genetics and Genomics (3)
- **IB 510 Discussions in Plant Biology; Biotechnology section (1)**
- IB 590 Individual Topics (Research) (2)

PSM Concentration

- **PSM 501, PSM Industry Seminar I (0-1)**
- **BADM 595 Business Fundamentals (2)**
- **BADM 508 Leadership and Teams (2)**

Spring Semester :

Plant Biotechnology coursework: 10 – 12 credit hours

- IB 420 Plant Physiology (3)
- CPSC 566 Plant Gene Regulation (4)
- IB 440 Plants and Global Change (3)
- IB 505 Bioinformatics & Systems Biol. (4)
- CPSC 588 Plant Biochemistry (4)
- CPSC 563 Chromosomes (3)
- IB 590 Individual Topics (2)
- **IB 510 Discussions in Plant Biology; Biotechnology section (1)**
- **IB 503 Applications/Methods in Biotech (3)**

PSM Concentration coursework

- **PSM 502, PSM Industry Seminar II (0-1)**
- **BADM 589 Project and Process Management (2)**
- **FIN 500 Finance (2)**

Summer Semester :

- **PSM 555 PSM Internship (0-1)**

Year 2

Fall Semester:

Plant Biotechnology Coursework: 10 – 12 credit hours

- IB 421 Photosynthesis (3)
- IB 477 Genomics for Crop Improvement (2)
- IB 424 Plant Development (3)
- IB 496 Readings in Development (1)
- IB 590 Individual Topics (Research) (2)
- IB 513 Discussions in Plant Physiology (1)
- IB 542 Environmental Plant Physiology (4)
- CPSC 452 Evol. Genetics and Genomics (3)
- **IB 510 Discussions in Plant Biology; Biotechnology section (1)**

PSM Concentration Coursework

- **PSM 503, PSM Industry Seminar III (0-1)**
- **NRES 598 Science and Regulatory Policy (2)**

Graduates are expected to be socially and politically literate to successfully manage workplace responsibilities and broader, discretionary responsibilities. The Illinois PSM seminars (PSM 501, 502, and 503) cover, in part, behavioral dimensions at the interface between science and business. Seminar topics include ethics and the responsible conduct of research; political and regulatory environments relative to new product development and intellectual properties; and the social and cultural environment of science-based enterprises.

The role of ethics and social responsibility, reflective of David Resnik's essay[1] on research ethics, is embedded in the seminars around the themes of

- building public support for and trust in science,
- promoting the aims of science and the scientific process,
- providing the basis for professional accountability, and
- supporting collaborative work.

Issues such as product safety, environmental ethics, and medical and technology ethics may be explored along with emerging issues such as genetically modified organisms, stem cell research, and nanotechnology.

[1] Resnik, David B. "What is Ethics in Research & Why is it Important?" NIH-NIEHS Bioethics Program. 26 October 2011. http://www.niehs.nih.gov/research/resources/bioethics/whatis/

Appendix B

Comparison of requirements for the current graduate major in Plant Biology (non-thesis MS) vs. proposed major in Plant Biotechnology (in conjunction with the Illinois PSM Concentration)

Courses:	Plant Biology non-thesis MS, PSM -- Required Hours	Plant Biotechnology non-thesis MS – Required Hours
Required course electives from approved study areas	12 (See POS for approved study areas; selected in consultation with advisor)	
Course electives selected in consultation with advisor	20 (selected in consultation with advisor; For approved courses see: life.uiuc.edu/plantbio/psm)	23 (selected in consultation with advisor; For approved courses see: life.uiuc.edu/plantbio/psm)
Individual Topics, IB 590 (Recommended elective; Maximum applied toward degree)	(Max 6)	(Max 6)
Language Requirement	Discretion of advisor	Discretion of advisor
IB 510 Discussions in Plant Biology; Biotechnology section (3 semesters)		1 each semester
IB 473 Plant Genomics		1
IB 474 Plant Proteomics-Metabolomics		2
IB 503 Applications/ Methods in Biotech		3
Internship PSM 555	0 -1	0-1
PSM Seminars 501, 502, 503	0 -1 each	0-1 each
PSM Concentration courses	10	10
Total hours:	42	42

Appendix C:

Key Features of the PSM Concentration to be Coupled with the Required Courses of the M.S. in Plant Biotechnology

There are three components of the PSM concentration:

1. Business curriculum (courses listed in table below)
2. Industry seminar series (PSM 501, 502, and 503)
3. Internship (PSM 555)

Business Curriculum (10 hours)

The business curriculum is a sequence of courses delivered primarily by the College of Business. These courses, common across all PSM programs, are intended to provide PSM students with core business knowledge and skills. In addition, the courses also will provide students with the behavioral skills important in the business world, in particular, communication skills, team building, and conflict resolution. Furthermore, students will develop an understanding of ethics and intellectual property, as it applies to science and the biotech industry.

The 10-hour business curriculum is subject to change each year. The planned mix of courses will be a function of (1) PSM alumni and industry feedback on priority content, (2) evolving and emerging business issues of particular importance to PSM students, (3) availability of additional courses that service non-PSM programs that may have sufficient capacity to accommodate at least a portion of the PSM students, and (4), when feasible, allowing for individual differences in students' business interests and career aspirations. Therefore, the specific business curriculum courses listed here may or may not be offered to PSM students in a given cohort; however, students will be advised of the exact mix of courses available to them at the time of their enrollment.

Term / Semester	Course	Title	Instructional Unit	Credit Hours
1 - Fall	BADM 595	Business Fundamentals	Business	2
1 - Fall	BADM 508	Leadership and Teams	Business	2
2 - Spring	FIN 500	Finance	Business	2
2 - Spring	BADM 589	Project and Business Management	Business	2
3 - Fall	NRES 598	Science and Regulatory Policy	ACES	2

Industry Seminar Series (3 semesters; 0-1 hours each)

The industry seminars provide opportunities for intellectual and social engagement for students across Illinois PSM programs. The seminars extend the professional preparation provided in the business curriculum. A key element of the seminar is invited guest lecturers in significant science-related leadership roles from business, industry, and

governmental organizations. Discussions will center on the problems and challenges introduced by the guest lecturer. All PSM students will enroll in a common seminar each semester, blending students from multiple disciplines to explore issues in common. Students in PSM programs have similar career aspirations and will thus benefit from exploring management, leadership, and career development issues together. Students will have the opportunity to learn about these issues not only as they relate to their specific area of study, but also to those in other Illinois PSM programs. PSM students will enroll in the seminar each semester in which they are enrolled in the cohort program (PSM 501, 502 and 503, respectively), excluding summer. In the final semester seminar, an emphasis is on learning from the internship experience during the preceding summer term and mentoring first semester students who are preparing for the internship. Students have the option of selecting 0 (S/U grading) or 1 (letter grading) credit hour for the industry seminar courses. The PSM 501, 502 and 503 PSM Industry Seminar Series classes and PSM 555 Internship are required for the PSM concentration but do not apply towards the 10 hours of business coursework required for it. Because these classes are a requirement for the degree, some students prefer that their academic record document their fulfillment of these requirements with courses that carry 1 credit hour and a letter grade. For other students, 0 credit hours and S/U suffices. Due to the absence of graduate-level science content, these classes will not be applied to the 32 hours of science coursework in the Plant Biotechnology major.

Internship (0-1 hours)

The internship is judged a necessary component of a professional graduate degree program whose goal is to produce graduates proficient in their science area of study with the knowledge, skills, and abilities to apply their proficiency to managerial and leadership challenges of business, government, and not-for-profits. Nationally, the majority of PSM programs require internships. Having completed two semesters of full-time graduate study before the internship, students will have had adequate science and business coursework to prepare them for work experiences in organizations. First semester students will be paired with third semester students for internship mentoring. Students will formulate plans for securing an internship early in their first semester of study as part of the required industry seminar series (PSM 501) and will implement plans no later than the beginning of their second semester of study. Students will evaluate their internship experience as part of their third semester industry seminar (PSM 503). Students complete one semester of full-time study after the internship is completed. The criteria for selection of internship companies and positions are determined for each student individually. In consultation with the program coordinator, students find internship companies and positions that match their individual career objectives and meet the learning goals of the program. The Illinois PSM, the academic program, and the student have joint responsibility for securing the internship. The program coordinator determines student deliverables and evaluation criteria and assigns course grades (S/U only). Students have the option of selecting 0 or 1 credit hour for PSM 555. The credit hour does not apply towards either the 32 science hours or 10 business hours required for the degree. For internationals holding student visas, internships are considered curriculum

practical training (CPT) and must be authorized in advance by International Student and Scholar Services.

Appendix D
(Notes on Budgetary and Staff Implications)

New Degree Programs – Required Budgetary Implication Questions

1) How does the unit intend to financially support this program?

The proposed major in Plant Biotechnology is to be used only with the PSM concentration and is intended to be self-supporting. Once fully operational, it is expected to generate sufficient new revenue from tuition to more than meet its operating costs.

2) Will the unit need to seek campus or other external resources?

No.

3) If no new resources are required, how will the unit create capacity or surplus to appropriately resource this program? (What functions or programs will the unit no longer support?)

Refer to page 4, Budgetary and Staff Implications, parts a and b.

4) Please provide a market analysis: What market indicators are driving this proposal? What type of employment outlook should these graduates expect? What resources will be required to assist students with job placement?

See attachment 1.

5) If this is a proposed graduate program, please discuss the programs intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

Financial assistance in the form of full or partial waiver of tuition and fees will not be available (except for statutory waivers).

Appendix E

Approvals to include courses from supporting disciplines for the proposed major in Plant Biotechnology.

September 22, 2011

Hello Steve,

I've included the information that you requested below. The Crop Sciences Department is in favor of including all of these classes in the new Professional Sciences Master's (PSM) Program in Plant Biology. We anticipate that all of these classes will continue to be offered. The additional students will be beneficial -capacity is available in the classes. I've added the enrollments for the last time each class was offered. Two other classes that you may want to consider are CPSC 452 Evol. Genetics and Genomics (3 hours) taught by Yoshie Hanzawa and CPSC 564 Molecular Marker Data Analyses (3 hours) taught by Patrick Brown. I've included information on these classes also.

CPSC 566	Plant Gene Regulation: offered each spring; enrollment 16
CPSC 588	Plant Biochem (online): Offered fall sem./odd years: enrollment 10
CPSC 440	Applied Statistical Methods I: Offered each sem., enrollment 60
CPSC 466	Genomics for Plant Improvement: Offered each fall sem/2nd eight weeks; enrollment 22
CPSC 563	Chromosomes: Offered each spring sem.; enrollment 10
CPSC 452	Evol. Genetics and Genomics: Offered each fall sem., enrollment 26
CPSC 564	Molecular Marker Data Analyses: Offered fall sem/even years: enrollment 19

Best Regards,

Fred

Frederic L. Kolb Cavanah
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-----Original Message-----

From: Steve Huber [mailto:schuber1@life.illinois.edu]
Sent: Tuesday, September 20, 2011 5:29 PM
To: Kolb, Fred
Cc: Huber, Joan Leigh Alderink
Subject: CPSC Course information

Dear Fred: Last year about this time I asked you for CPSC course information to include with a proposal that was submitted for a new Professional Science Master's (PSM) Program in Plant Biology. That program was approved and the first cohort of 3 students started this semester. We are now submitting a proposal for a new graduate major in Plant Biotechnology to better reflect the content of the program and need to update your letter to include with the proposal. (This is essentially a name change for the current program, and if successful, we will terminate the other one). Attached is a copy of my original email to you and your response, modified in terms of the courses that we are asking for students to potentially be able to take. We have removed the Ethics class and added Molecular Cytogenetics. Can you craft a new letter in response? The proposal has been moving slowly through the system, and we just learned today that we need a new letter from you to proceed. Ideally, we would have your letter no later than early next week....if at all possible. Sorry for the urgent request, but we just came aware of it today. Thanks so much for your continued help! I am the official faculty advisor for the program, and Joan Huber (copied on this email) is the Program Coordinator who is dealing with this proposal and other things on a day to day basis. If you have any questions, you could direct them to Joan by email or phone (office: 333-5498) as I am out of town the rest of this week.

Thanks again!

steve --

Steven C. Huber
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[Note: No new library materials and services will be required by the new MS in Plant Biotechnology and associated Professional Science Master's concentration. Hence, the original letter of approval is included here.]

July 2, 2010

Feng Sheng Hu,
Professor and Head, Department of Plant Biology
University of Illinois
265 Morrill Hall
505 S. Goodwin Avenue
Urbana, IL 61801

Dear Dr. Hu:

Thank you for giving the University Library the opportunity to review the Department of Plant Biology's proposal to the Senate Committee on Educational Policy to establish a new Establish a Master of Science in Plant Biology with a Concentration in Professional Science Master's. Based upon the proposal that we reviewed, it is our understanding that this degree will provide an option for those students seeking a terminal master's degree (i.e., not necessarily en-route to the doctorate) as an option for preparing themselves for careers in plant science and related areas that are combined with business-related responsibilities. After being reviewed by two of our subject specialists, the proposal materials that you provided to the University Library do not lead any of us to believe that there will be an appreciable impact on our operations or collections.

If additional services or materials are required as the program develops, we will be happy to discuss securing the requisite resources with the program sponsors.

Sincerely,

Paula Kaufman
University Librarian and Dean of Libraries

Cc: Thomas Teper
Katie Newman
Diane Schmidt

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Graduate College

204 Coble Hall
801 South Wright Street
Champaign, IL 61820-6210

November 15, 2012

Andrea Golato, *associate dean, Graduate College*
Karen Carney, *associate dean, College of LAS*

Dear Deans Golato and Carney,

I am writing on behalf of the Illinois Professional Science Master's (PSM) regarding the proposal for a new graduate major in plant biotechnology paired with a professional science master's concentration. This is in response to Dean Carney's request on November 13, 2012, for a letter of support.

The proposed program will supplant the existing plant biology PSM program.

Because the proposed program is a continuation of the existing program in all material aspects except program name, no marginal increase in resources is required.

At the campus level, the Illinois PSM will continue supporting the program as part of the portfolio of PSM program. At the program level, the plant biology department has committed three years funding support for a full-time coordinator committed exclusively to the plant biology/plant biotechnology program.

Should the program grow to require more resources than currently allocated, those resources will be funded by the tuition revenue generated by the enrollment growth as the program is required to be self-supporting after start-up.

Thank you for considering this information. Should you have additional questions, please let me know.

Sincerely,

Kevin W. Sightler, Ph.D.
Director, Illinois PSM

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Scope of Engagement Work

The overall objective of this engagement is to determine the interest level in a potential new graduate program at the University of Illinois, a Professional Science Master's degree in Biotechnology. The interest will be determined from both the prospective student level and potential employee level.

- Estimate the interest the U of I student population would have in a PSM in Biotechnology
  - Develop a survey that would demonstrate respondents interest in program and preference in curriculum
  - Distribute survey to key targets in ACES college and MCB/IB departments
- Determine interest in potential employers of graduate of program
  - Find contacts at list of organization provided
  - Estimate employer interest in program
  - Determine preference in curriculum and other recommendations from employers

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The PSM in Biotechnology

- The PSM is a new type of master's degree that combines advanced study in science with business knowledge and skills, for people who want to work in managerial, science-based positions

- The BIOTECHNOLOGY program at Illinois would combine critical "real world" experience and knowledge of the legal, ethical and business issues of this field with a mastery of the scientific principles and knowledge relevant to biotechnological industries.

- Like other Illinois PSM programs, the BIOTECHNOLOGY program would be completed in 16 months – three semesters plus a summer internship.

- **How does a PSM differ from a tradition M.S. degree?**

- its lack of thesis requirement, applied focus, combination of coursework in science and business, and its internship.

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Summary of Findings

Students

- Demonstrated interest in this type of program
- Valued the ability to specialize in topics: animal or plant
- Cost and potential salaries could play a factor in enrollment
- Alternative to veterinary school

Employers

- Demonstrated interest in this type of program
- Saw the potential to develop project managers: a key position in the field
- Require hands on experience through lab work or internship
- Well rounded students are a bonus, but strong fundamental background is still necessary

Student Analysis

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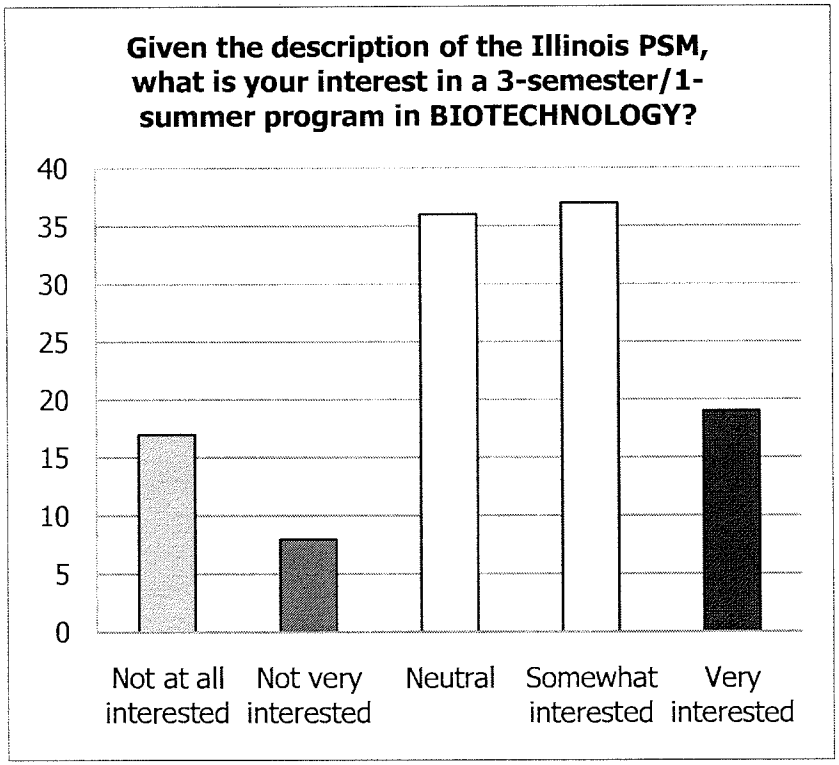
Summary of Survey

- **Total Survey Response**:
  - Total Surveyed: 155, Total Completed: 114

Freshman	50	ACES	103
Sophomore	29		
Junior	38	LAS	41
Senior	32		

- **Interest in an Illinois PSM:**
  - Only 25% of respondents had no interest in a biotechnology related career
  - The tuition and fees would have at least some impact on almost 75% of respondents
  - Twice as many people would be more interested in an animal specialization over plant
    40% in Animal vs. 19% in Plant



47% of respondents had interest in the program

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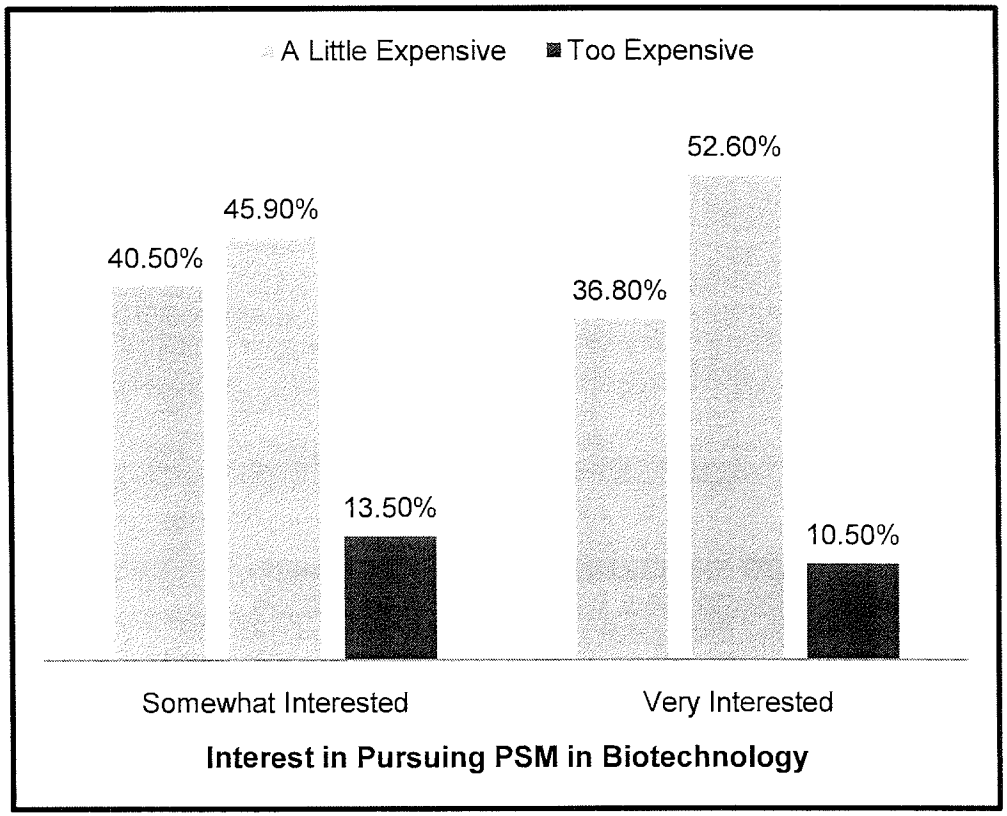
Cost of Program

- **Impact of Cost for Interested Students**
  - No Impact- 5.4%
  - Little Impact- 12.5%
  - Some Impact- 37.5%
  - Considerable Impact- 26.8%
  - Great Impact- 17.9%

- **Impact of Salary Potential on Interest**
  - No Impact- 3.6%
  - Little Impact- 10.9%
  - Some Impact- 43.6%
  - Considerable Impact- 30.9%
  - Great Impact- 10.9%



About 60% of interested respondents thought the program cost was expensive

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Student Preferences

Program

Top four important aspects

1. Faculty Accessibility
2. Hands on Experience with Lab Equipment
3. Internship/Real World Experience
4. Networking with Companies

Bottom two aspects

1. Small Class Size
2. Flexible Curriculum

Coursework

Top four important topics

1. Project Management
2. Strategy
3. Transitioning from Scientist to Manager
4. Technology and Innovation Management

Bottom two topics

1. Accountancy
2. Policy Studies

Students would most require access to faculty and real work experience through lab work or internship and learn about topics relating to managing a project

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Who is interested?

Students would most be interested in having the choice in specialization depending on their interest

Of the students that were "Very interested" in the program:

1. MCB students were interested in both Animal & Plant Biotechnology
2. Crop Science students were interested in Plant Biotechnology
   - CPSC 261 is a course in Biotechnology
3. There was a surprising interest from Animal Sciences majors who could use this program as an alternative to Vet school. An even larger number said they were "somewhat interested" in the program

75% had GPAS above 3.0

Students preference in a graduate program matched their choice for undergraduate study

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Employer Analysis

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Graduate Recruitment

What do you look for in an applicant with a graduate degree?

- Work experience, coursework, leadership and "academic experience"
- Lab and/or internship work is crucial to most firms
- GPA was weighted heavily at some firms

What positions are graduate school applicants appointed to?

- Some new hires are placed in managerial positions (DuPont)
- Others place new hires in a slightly higher role than undergrad hires, but have higher opportunities for promotion

Firms need to see applicable, hands-on experience from applicant

PSM in Biotechnology

Where would a PSM in Biotechnology grad fit into your recruiting?

- Either advanced scientist or direct to manager

"Can see the truth in projects. Is this case worthy of what's going on? Ultimately these things have to make money." Larry Hagemen, DuPont

- Firms need lawyers and lab rats. PSM graduates are a way to connect the two sides while guiding business direction

- All the firms would consider graduates of this type of program for recruitment
    - Several go out and search for this type of training and these were the companies that saw the PSM as a way to train managers

Overall, employers seemed interested in PSM candidates

Program Preferences

What topics need to be covered in a PSM in Biotechnology?

- **PROJECT MANAGEMENT-** The overwhelming response indicated that employers want applicants trained in seeing if a project has potential and managing it from a business standpoint

"They do not need have to be a PhD, but have to be able to interact with scientist to know… does this project have any merit or potential? They are not going to be in the lab, but are they going to be able to look at a project and be able to estimate what it is worth?" – Larry Hagemen, DuPont

- Technical Skills – Applicants need to a have a fundamental basis in science specific to firm
- Finance/Budgeting/Allocation of resources- General (not industry specific)
- Human Resources/Communication skills
- Hands on training is still extremely important

The training required depends on if the firm is looking for a manager or an advanced scientist

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Key Takeaways

There is strong demand of this type of program from both students and employers

Concerns to Students

- The cost of the program and potential salaries of graduates
- A well developed program with internships available and supportive organizations

Concerns to Employers

- Employers need to see well rounded students
- A foundation of technical skills and hands on experience

Biotechnology PSM Survey

1. Introduction

This survey is about a possible new master's degree program in BIOTECHNOLOGY at the University of Illinois at Urbana-Champaign.

Your input will help us determine level of interest in the program. You will also help us make important decision about courses, specializations, admissions, and more.

Please answer the following questions to tell us what you think.

Participation is voluntary and your answers are anonymous. Completing the survey will take about 5 to 10 minutes.

Thank you for your help.

For additional information about the program, a web address and email address are provided at the end of the survey.

Biotechnology PSM Survey

2. About the PSM Program

The BIOTECHNOLOGY master's degree would be part of the Illinois Professional Science Master's program – the Illinois PSM.

The PSM is a new type of master's degree that combines advanced study in science with business knowledge and skills. It's for people who want to work in science-based positions that also have managerial and leadership responsibilities. The PSM integrates experiences to develop behavioral skills highly valued by employers such as teambuilding, decision making, conflict resolution, communication, and visioning.

With experience, consulting scientist, clinical director, and technology transfer manager are a few of the positions for which PSM graduates would be well-suited.

The BIOTECHNOLOGY program at Illinois would combine critical "real world" experience and knowledge of the legal, ethical and business issues of this field with a mastery of the scientific principles and knowledge relevant to biotechnological industries. It would be distinguished from traditional M.S. degree programs by its lack of thesis requirement, applied focus, combination of coursework in science and business, and its internship. Like other Illinois PSM programs, the BIOTECHNOLOGY program would be completed in 16 months – three semesters plus a summer internship.

Biotechnology PSM Survey

1. Are you a student of the University of Illinois (or alumnus)?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	Very interested	Response Totals
Yes.	**97.4%** **(37)**	**94.7%** **(18)**	**96.5%** **(55)**
No.	2.6% (1)	5.3% (1)	3.5% (2)
answered question	38	19	**57**
		skipped question	**0**

2. Are you a graduate student?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	Very interested	Response Totals
Yes.	2.6% (1)	0.0% (0)	1.8% (1)
No.	**97.4%** **(37)**	**100.0%** **(19)**	**98.2%** **(56)**
answered question	38	19	**57**
		skipped question	**0**

3. In what college are you enrolled?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
College of Agricultural, Consumer and Environmental Sciences	**63.2% (24)**	47.4% (9)	**57.9% (33)**
College of Applied Health Sciences	2.6% (1)	0.0% (0)	1.8% (1)
College of Business	0.0% (0)	0.0% (0)	0.0% (0)
College of Education	0.0% (0)	0.0% (0)	0.0% (0)
College of Engineering	0.0% (0)	0.0% (0)	0.0% (0)
College of Fine and Applied Arts	0.0% (0)	0.0% (0)	0.0% (0)
College of Law	0.0% (0)	0.0% (0)	0.0% (0)
College of Liberal Arts and Sciences	34.2% (13)	**52.6% (10)**	40.4% (23)
College of Media	0.0% (0)	0.0% (0)	0.0% (0)
College of Medicine at Urbana-Champaign	0.0% (0)	0.0% (0)	0.0% (0)
College of Veterinary Medicine	0.0% (0)	0.0% (0)	0.0% (0)
Division of General Studies	0.0% (0)	0.0% (0)	0.0% (0)
Graduate School of Library and Information Science	0.0% (0)	0.0% (0)	0.0% (0)
Institute of Aviation	0.0% (0)	0.0% (0)	0.0% (0)

School of Labor and Employment Relations	0.0% (0)	0.0% (0)	0.0% (0)
School of Social Work	0.0% (0)	0.0% (0)	0.0% (0)
answered question	38	19	**57**
		skipped question	**0**

4. What is your major?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Count**
	38 replies	19 replies	57
answered question	38	19	**57**
		skipped question	**0**

5. What is your minor?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Count**
	19 replies	9 replies	28
answered question	19	9	**28**
		skipped question	**29**

6. What is your cumulative GPA?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
3.50-4.00	**52.6% (20)**	26.3% (5)	**43.9% (25)**
3.00-3.49	23.7% (9)	**47.4% (9)**	31.6% (18)
2.50-2.99	21.1% (8)	15.8% (3)	19.3% (11)
2.00-2.49	2.6% (1)	10.5% (2)	5.3% (3)
Less than 2.00	0.0% (0)	0.0% (0)	0.0% (0)
answered question	38	19	**57**
		skipped question	**0**

7. What is your expected graduation date?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
I've already graduated	2.6% (1)	5.3% (1)	3.5% (2)
2010	31.6% (12)	26.3% (5)	29.8% (17)
2011	15.8% (6)	**31.6% (6)**	21.1% (12)
2012	15.8% (6)	10.5% (2)	14.0% (8)
2013	**34.2% (13)**	26.3% (5)	**31.6% (18)**
2014 or later	0.0% (0)	0.0% (0)	0.0% (0)
answered question	38	19	**57**
		skipped question	**0**

8. Have you been involved in any biotechnology-related student organizations or coursework?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
Yes.	31.6% (12)	47.4% (9)	36.8% (21)
No.	**68.4% (26)**	**52.6% (10)**	**63.2% (36)**
If Yes, Please Explain.	9 replies	9 replies	18
answered question	38	19	**57**
		skipped question	**0**

9. Which area of specialization within the program might be of interest to you?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
Plant Biotechnology	28.9% (11)	21.1% (4)	26.3% (15)
Animal Biotechnology	**60.5% (23)**	31.6% (6)	**50.9% (29)**
Both	10.5% (4)	**42.1% (8)**	21.1% (12)
Neither	0.0% (0)	5.3% (1)	1.8% (1)
answered question	38	19	**57**
		skipped question	**0**

10. The following is a list of business and business-related topics that could be included in the Illinois PSM's business curriculum. Please rate your level of interest in each topic.

		Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
		Somewhat interested	Very interested	Response Totals
Accounting	**Not Interested at all**	**35.1% (13)**	**36.8% (7)**	
	Somewhat uninterested	13.5% (5)	26.3% (5)	
	Neutral	16.2% (6)	15.8% (3)	
	Somewhat interested	32.4% (12)	10.5% (2)	
	Very interested	2.7% (1)	10.5% (2)	
		37	19	56
Business Communication	**Not Interested at all**	19.4% (7)	15.8% (3)	
	Somewhat uninterested	11.1% (4)	21.1% (4)	
	Neutral	22.2% (8)	5.3% (1)	
	Somewhat interested	**36.1% (13)**	**36.8% (7)**	
	Very interested	11.1% (4)	21.1% (4)	
		36	19	55
Entrepreneurship	**Not Interested at all**	10.8% (4)	15.8% (3)	
	Somewhat uninterested	5.4% (2)	10.5% (2)	
	Neutral	32.4% (12)	5.3% (1)	

	Somewhat interested	**35.1% (13)**	21.1% (4)	
	Very interested	16.2% (6)	**47.4% (9)**	
		37	19	56
Ethics	**Not Interested at all**	8.3% (3)	10.5% (2)	
	Somewhat uninterested	13.9% (5)	5.3% (1)	
	Neutral	25.0% (9)	15.8% (3)	
	Somewhat interested	**33.3% (12)**	31.6% (6)	
	Very interested	19.4% (7)	**36.8% (7)**	
		36	19	55
Finance	**Not Interested at all**	21.6% (8)	10.5% (2)	
	Somewhat uninterested	21.6% (8)	31.6% (6)	
	Neutral	18.9% (7)	5.3% (1)	
	Somewhat interested	**35.1% (13)**	**36.8% (7)**	
	Very interested	2.7% (1)	15.8% (3)	
		37	19	56
Human Resource Management	**Not Interested at all**	16.2% (6)	10.5% (2)	
	Somewhat uninterested	18.9% (7)	10.5% (2)	
	Neutral	24.3% (9)	15.8% (3)	

	Somewhat interested	**32.4% (12)**	**47.4% (9)**	
	Very interested	8.1% (3)	15.8% (3)	
		37	19	56
Marketing	**Not Interested at all**	10.8% (4)	15.8% (3)	
	Somewhat uninterested	13.5% (5)	5.3% (1)	
	Neutral	27.0% (10)	21.1% (4)	
	Somewhat interested	**35.1% (13)**	**36.8% (7)**	
	Very interested	13.5% (5)	21.1% (4)	
		37	19	56
Negotiation	**Not Interested at all**	5.4% (2)	10.5% (2)	
	Somewhat uninterested	21.6% (8)	5.3% (1)	
	Neutral	24.3% (9)	26.3% (5)	
	Somewhat interested	**35.1% (13)**	26.3% (5)	
	Very interested	13.5% (5)	**31.6% (6)**	
		37	19	56
People and Technology at Work	**Not Interested at all**	8.1% (3)	5.3% (1)	
	Somewhat uninterested	10.8% (4)	15.8% (3)	
	Neutral	21.6% (8)	10.5% (2)	
	Somewhat interested	**40.5% (15)**	26.3% (5)	

	Very interested	18.9% (7)	**42.1% (8)**	
		37	19	56
Policy Studies	**Not Interested at all**	13.5% (5)	10.5% (2)	
	Somewhat uninterested	16.2% (6)	21.1% (4)	
	Neutral	**43.2% (16)**	**31.6% (6)**	
	Somewhat interested	21.6% (8)	**31.6% (6)**	
	Very interested	5.4% (2)	5.3% (1)	
		37	19	56
Project Management	**Not Interested at all**	5.4% (2)	10.5% (2)	
	Somewhat uninterested	10.8% (4)	0.0% (0)	
	Neutral	8.1% (3)	15.8% (3)	
	Somewhat interested	**73.0% (27)**	26.3% (5)	
	Very interested	2.7% (1)	**47.4% (9)**	
		37	19	56
Strategy	**Not Interested at all**	5.4% (2)	15.8% (3)	
	Somewhat uninterested	5.4% (2)	0.0% (0)	
	Neutral	18.9% (7)	10.5% (2)	
	Somewhat interested	**54.1% (20)**	**42.1% (8)**	

	Very interested	16.2% (6)	31.6% (6)	
		37	19	56
Technology and Innovation Management	**Not Interested at all**	8.3% (3)	0.0% (0)	
	Somewhat uninterested	5.6% (2)	5.3% (1)	
	Neutral	25.0% (9)	15.8% (3)	
	Somewhat interested	**44.4% (16)**	15.8% (3)	
	Very interested	16.7% (6)	**63.2% (12)**	
		36	19	55
Transitioning from Scientist to Manager	**Not Interested at all**	11.1% (4)	5.6% (1)	
	Somewhat uninterested	13.9% (5)	5.6% (1)	
	Neutral	16.7% (6)	27.8% (5)	
	Somewhat interested	**36.1% (13)**	22.2% (4)	
	Very interested	22.2% (8)	**38.9% (7)**	
		36	18	54
Other – please specify	**Not Interested at all**	10.0% (1)	**100.0% (1)**	
	Somewhat uninterested	0.0% (0)	0.0% (0)	
	Neutral	**90.0% (9)**	0.0% (0)	
	Somewhat interested	0.0% (0)	0.0% (0)	
	Very interested	0.0% (0)	0.0% (0)	

	10	1	11
Other (please specify)	0 replies	0 replies	0
answered question	37	19	**56**
		skipped question	**1**

11. How important would you find the following aspects of a PSM program in BIOTECHNOLOGY?

		Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
		Somewhat interested	**Very interested**	**Response Totals**
Ability to take classes other than those required	**Not Important at All**	2.7% (1)	21.1% (4)	
	Somewhat Important	**56.8% (21)**	31.6% (6)	
	Very Important	40.5% (15)	**47.4% (9)**	
		37	19	56
Extracurricular opportunities	**Not Important at All**	2.8% (1)	10.5% (2)	
	Somewhat Important	38.9% (14)	31.6% (6)	
	Very Important	**58.3% (21)**	**57.9% (11)**	
		36	19	55
Faculty accessibility and mentoring	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	21.6% (8)	15.8% (3)	
	Very Important	**75.7% (28)**	**84.2% (16)**	

		37	19	56
Flexible, individualized curriculum	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	37.8% (14)	47.4% (9)	
	Very Important	**59.5% (22)**	**52.6% (10)**	
		37	19	56
Hands-on experience with lab instrumentation	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	13.5% (5)	26.3% (5)	
	Very Important	**83.8% (31)**	**73.7% (14)**	
		37	19	56
Interaction with other PSM students	**Not Important at All**	5.4% (2)	5.3% (1)	
	Somewhat Important	29.7% (11)	10.5% (2)	
	Very Important	**64.9% (24)**	**84.2% (16)**	
		37	19	56
Internship/real-world experience	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	16.2% (6)	10.5% (2)	
	Very Important	**81.1% (30)**	**89.5% (17)**	
		37	19	56
Lab research	**Not**	2.7%	0.0%	

	Important at All	(1)	(0)	
	Somewhat Important	29.7% (11)	26.3% (5)	
	Very Important	**67.6% (25)**	**73.7% (14)**	
		37	19	56
National affiliation with other PSM students + alumni	**Not Important at All**	13.5% (5)	10.5% (2)	
	Somewhat Important	**51.4% (19)**	36.8% (7)	
	Very Important	35.1% (13)	**52.6% (10)**	
		37	19	56
Networking with companies	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	24.3% (9)	10.5% (2)	
	Very Important	**73.0% (27)**	**89.5% (17)**	
		37	19	56
Practical, applied experience	**Not Important at All**	2.7% (1)	0.0% (0)	
	Somewhat Important	10.8% (4)	0.0% (0)	
	Very Important	**86.5% (32)**	**100.0% (19)**	
		37	19	56
Small class size	**Not Important at All**	5.4% (2)	5.3% (1)	
	Somewhat Important	**48.6% (18)**	**52.6% (10)**	

Very Important	45.9% (17)	42.1% (8)	
	37	19	56
answered question	37	19	**56**
		skipped question	**1**

12. Are you interested in a career related to plant or animal BIOTECHNOLOGY?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
Very interested and I'm familiar with the potential career possibilities.	5.3% (2)	42.1% (8)	17.5% (10)
Interested but I would like to learn more about the area and possibilities	**52.6% (20)**	**47.4% (9)**	**50.9% (29)**
Somewhat interested but no more so than in other post-graduate options	36.8% (14)	10.5% (2)	28.1% (16)
No interest	5.3% (2)	0.0% (0)	3.5% (2)
Please share any additional comments	0 replies	2 replies	2
answered question	38	19	**57**
		skipped question	**0**

13. Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
Not at all interested	0.0% (0)	0.0% (0)	0.0% (0)
Not very interested	0.0% (0)	0.0% (0)	0.0% (0)
Neutral	0.0% (0)	0.0% (0)	0.0% (0)
Somewhat interested	**100.0% (38)**	0.0% (0)	**66.7% (38)**
Very interested	0.0% (0)	**100.0% (19)**	33.3% (19)
answered question	38	19	**57**
		skipped question	**0**

14. Tuition and fees for a 16-month Illinois PSM program in BIOTECHNOLOGY will be about $31,000 (in-state tuition rate). This is about the same amount an Illinois undergraduate in life sciences would pay for the same number of semesters. What's your opinion of the costs?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
Too cheap	0.0% (0)	0.0% (0)	0.0% (0)
A little cheap	0.0% (0)	0.0% (0)	0.0% (0)
A good value/reasonably priced	42.1% (16)	36.8% (7)	40.4% (23)
A little expensive	**44.7% (17)**	**52.6% (10)**	**47.4% (27)**
Too expensive	13.2% (5)	10.5% (2)	12.3% (7)
answered question	38	19	**57**
		skipped question	**0**

15. As a professional program, Illinois PSM students pay all tuition and fees. Assistantships or fellowships are rarely available but students may qualify for loans. What impact would this have on your decision to enroll in the BIOTECHNOLOGY PSM program?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
No impact at all	2.6% (1)	10.5% (2)	5.3% (3)
Little impact	10.5% (4)	15.8% (3)	12.3% (7)
Some impact	**44.7% (17)**	26.3% (5)	**38.6% (22)**
Considerable impact	23.7% (9)	**31.6% (6)**	26.3% (15)
Great impact	18.4% (7)	15.8% (3)	17.5% (10)
answered question	38	19	**57**
		skipped question	**0**

16. There is a wide range of BIOTECHNOLOGY-related careers, so it's hard to pin down a specific salary for someone with a BIOTECHNOLOGY master's degree. Given the sample salaries at the beginning of this survey, what impact does salary potential have on your decision to enroll in the BIOTECHNOLOGY PSM program?

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Totals**
No impact at all	2.7% (1)	5.3% (1)	3.6% (2)
Little impact	10.8% (4)	10.5% (2)	10.7% (6)
Some impact	**45.9% (17)**	**36.8% (7)**	**42.9% (24)**
Considerable impact	35.1% (13)	26.3% (5)	32.1% (18)
Great impact	5.4% (2)	21.1% (4)	10.7% (6)
answered question	37	19	**56**
		skipped question	**1**

17. If you have any further comments about the Illinois PSM in BIOTECHNOLOGY, please share with us here:

	Given the description of the Illinois PSM, what is your interest in a 3-semester/1-summer program in BIOTECHNOLOGY?		
	Somewhat interested	**Very interested**	**Response Count**
	0 replies	4 replies	4
answered question	0	4	**4**
		skipped question	**53**

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820

January 11, 2013

Gay Miller, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Miller:

Enclosed is a copy of a proposal from the Graduate College and the College of Liberal Arts and Sciences to establish a Masters of Science in Plant Biotechnology with a Professional Science Masters concentration.

This proposal has been approved by the Graduate College, College of Liberals Arts and Sciences' Committee on Courses and Curricula and Executive Committee. It now requires Senate review.

Sincerely,

Kristi A. Kuntz
Assistant Provost

KAK/njh

Enclosures

c: K. Carney
A. Edwards
F. Sheng Hu
E. DeLucia
J. Huber

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Dean

College of Liberal Arts and Sciences
294 Lincoln Hall
702 South Wright Street
Urbana, IL 61801-3631

June 29, 2012

Andrea Golato
Associate Dean
Graduate College
204 Coble Hall MC-322

Dear Dean Golato:

The Committee on Courses and Curricula, Dean's Cabinet, and Executive Committee on behalf of the Faculty of the College of Liberal Arts and Sciences has voted to approve the following proposal:

Establish a New Major Leading to a Master's of Science in Plant Biotechnology in Conjunction with a Professional Science Master's Concentration within the Department of Plant Biology, College of LAS

Please address all correspondence concerning this proposal to me. This proposal is now ready for review by the Graduate College for proposed implementation Fall 2013.

Sincerely,

Diane Musumeci
Associate Dean

enclosures
C: Professor Feng Sheng Hu
Professor Evan DeLucia
Dr. Joan Huber