

HECB FORM 1

NEW DEGREE PROGRAM PLANNING NOTICE OF INTENT
(PNOI)

HECB
RECEIVED

APR 06 2011

Program Information

Program Name: Professional Science Master's Degree

Institution Name: Washington State University

Degree Granting Unit: Graduate School

Degree: PSM Level Masters Type Science

Concentrations: Molecular Biosciences CIP Code: 26.0613
Bio products CIP Code: 26.0202
Environmental Sustainability CIP Code: 03.0102
Financial Mathematics CIP Code: 27.0305

Proposed Start Date: Fall 2012

Projected Enrollment (FTE) in Year One: 16 FTE At Full Enrollment by Year: 2014 : 20 FTE

Proposed New Funding: No new funding – reallocation of current funds

Funding Source: State FTE Self Support Other

Mode of Delivery / Locations

On- Campus Delivery Pullman, Vancouver, Tri-Cities

Distance Learning Statewide

Substantive Statement of Demand and Need

(See Attached)

Contact Information (Academic Department Representative)

Name: Norah R. McCabe
Title: Clinical Associate Professor
Address: Graduate School
P.O. Box 641030
Pullman, WA 99164-1030
Telephone: 509 335-1134
Fax: 509 335-1949
Email: nrmccabe@wsu.edu



Endorsement by Chief Academic Officer

03/24/11

Date

Substantive Statement of Demand and Need

This proposal seeks approval to develop a WSU System-wide Professional Science Master's degree (PSM) which will be administered from the WSU Graduate School.

PSM degree programs were initiated in 1997, and presently 230 different programs are offered in 106 different institutions across the nation as of February 2011. PSMs are innovative, terminal graduate degrees that typically consist of graduate training in an emerging area of science, mathematics, or engineering, with a professional component that often includes an internship and "cross-training" with courses in business and communication. Nationally, however, existing PSM programs are concentrated in densely populated areas of California and the southern and northeastern states, with a marked dearth of programs in the Pacific and Inland Northwest regions¹. To fill this gap, recent PSM programs in natural resource management at neighboring University of Idaho have begun, however access to such interdisciplinary science master's degrees remains a largely unmet need in most of Washington.

Thus this proposal to develop a new system-wide PSM degree at WSU, which will be available both in a hybrid and online format, will further answer this need. The system-wide degree is projected to include tracks offered in Molecular Biosciences and Computational Financial Mathematics at the Pullman campus, as well as tracks on regional campuses, including a track in Environmental Sustainability at WSU-Vancouver, and a track in Bioproducts at WSU-TriCities. The system-wide PSM program will be modeled on other national PSM degrees featuring a diverse curriculum designed for a critically needed new generation of interdisciplinary-trained professionals. The curriculum will be composed of at least 50% professional courses, including a workplace-based internship, and up to 50% graduate-level science/math/engineering coursework. The curriculum will be designed to obtain Council of Graduate Schools (CGS) recognition of the PSM degree, and use of the National Professional Science Master's Association (NPSMA) logoⁱⁱ.

A significant and innovative feature of WSU's proposed system-wide PSM is that the degree will be offered both on-site at WSU-P, WSU-TC and WSU-VC and/or online in collaboration with the established Center for Distance and Professional Education/ WSU Online (CDPE/WSU Online) administered from the Pullman campus. Thus the same student services infrastructure established for current online-learning students at WSU will be used to support the online courses in the

PSM program. Currently, approximately 7% of PSM degree programs are offered online, so the proposed development of an online PSM degree will have additional impact by being accessible to all qualified individuals across the state, as well as in the Northwest, helping to reduce disparities in access to and completion of graduate and professional education. In particular, Washington state is reported to place 42nd among all states for number of advanced degrees per 1,000 citizensⁱⁱⁱ.

Importantly, the proposed system-wide PSM degree at WSU will also increase access to graduate education for Washington's growing Hispanic population, which increased from 4.4% to 15.1% of the state's population between 1990 and 2009, but which is concentrated away from our largest cities. This program, therefore, will complement WSU's efforts to expand opportunities for this group traditionally underrepresented in higher education^{iv}.

In addition WSU's proposed system-wide PSM degree, developed to align with workforce needs, is likely to have a broad reach and significant regional impact. The program will offer multiple "win-win" situations for rural populations and economies in the northwest by retaining intellectual talent and increasing the number of community members with graduate degrees. It will provide students with a way to remain in science, gain the skills needed to secure well-paying jobs without pursuing a traditional science graduate degree, and provide employers in academia, industry, and government with a highly trained pool of potential employees.

Prospects for the successful placement of PSM graduates are excellent. Nationally, PSM graduates have a high employment rate and many of them are employed in the state where they graduated. Current data additionally indicate that PSM graduates earn at least \$10,000 more than students graduating with a traditional Master's of Science degree^v.

Like several other multidisciplinary degrees, the WSU system-wide PSM degree will be administered through the Graduate School at the WSU Pullman campus, which more generally oversees all graduate programs in the system.

As all PSM students will be required to take a core of professional courses, we envision cohorts of students with the same professional training, yet distinct disciplinary training in Molecular Biosciences and Computational Financial Mathematics, Environmental Sustainability, Bioproducts, and other areas as new

tracks are developed. The core professional courses will provide linkages among all PSM tracks to make it a true system-wide program. This combination of shared and distinct educational backgrounds will also inspire and elevate course discussions that will enrich the learning experience. The current PSM option within the MS Molecular Biosciences degree will become a track within this new degree.

Local opportunities for internships and employment for students in the current PSM-Molecular Biosciences program include positions in academic research programs and diverse biotechnology companies. Some initial opportunities include those started by faculty members from WSU and nearby University of Idaho involved in the development of technologies ranging from genetic analyses of patient samples to farm animal pregnancy field tests. The PSM track in Computational Financial Mathematics will prepare students for work in a wide spectrum of financial services including investment firms, insurance companies and government regulatory institutions. Similarly, a PSM track in Environmental Sustainability at WSU-V will lead to opportunities in fisheries research and agricultural product chemistry, and students in a WSU-TC track in Bioproducts will be well-positioned for employment in Washington's growing biorefining and bioproducts industry, including WSU's Center for Bioproducts and Bioenergy, the Bioproducts, Sciences, and Engineering Laboratory (BSEL), the Pacific Northwest Regional Laboratory (PNNL), and private companies. As the PSM grows system-wide, additional tracks will be developed to reflect the unique academic strengths of each WSU campus. The development of the PSM degree at WSU is a direct response to student demand at WSU. Science and Math undergraduates are actively seeking academic training spanning other areas. This trend is increasingly evident, with as many as 11% of current SMB (School of Molecular Biosciences) and 15% of current Math undergraduates (internal data) obtaining double majors and double degrees in the quest to align the relevancy of their education with the demands of current career opportunities. The recognition that undergraduates are looking for breadth in their education, and that many seniors (internal data) are interested in earning some type of graduate degree, provides a sense of urgency and need for the development of a system-wide PSM at WSU.

The other critical shareholders in the development of a PSM degree are employers, whose enthusiasm for such a degree program and offering of internships is overwhelming. We have contacted employers in the Pullman, Spokane, TriCities and Vancouver areas and we have determined that there is employer interest in

offering student internships. Some of these employers are past and current WSU faculty, thus this new degree will effectively bridge the gap between academia and the workplace. The number of employers who have expressed an interest in partnering with WSU in offering PSM students internships is an indication of the need for such a program at WSU.

In addition, to better gauge interest in a system wide PSM degree and preference for format of delivery (on campus, online, or combination/hybrid), a survey of students and alumni was conducted and a summary of the results are found below.

1. WSU Survey Results of Student Interest in a PSM degree at WSU

These data were collected from a survey of student interest in earning a PSM degree, conducted in 2010, of WSU science undergraduates, graduates and alumni, for which 300 responses were received. The following are data from three of the questions.

1. For each of the Master’s degrees listed below, indicate the likelihood you would pursue each

	Not at all likely	Somewhat Unlikely	Somewhat likely	Very Likely
PSM	14% (38)	16% (44)	46% (126)	23%(63)
Science MS	12% (32)	16% (44)	44% (120)	25% (69)
Non-science M	43% (117)	21% (58)	19.5% (53)	7% (20)

2. Respondents were asked to rank their preference for three PSM tracks. 1 =top choice.

	1	2	3
• Molecular Biosciences	52%	13%	34%
• Environmental Sustainability	37%	26 %	36%
• Bioproducts	10%	60%	28%

3. Which of the following formats would you be most likely to enroll in? 1=top choice

	1	2	3
• On-campus only:	32%	20%	47%
• Hybrid format:	29%	67%	5%
• Online only:	40%	14%	47%

Based on the enthusiastic response to this survey, a PSM information workshop for WSU faculty from the regional campuses was organized. The workshop featured PSM experts Stephen Lemire from the National Professional Science Master’s Association (NPSMA), Dr. Ursula Bechert from the PSM program at Oregon State University, and Dr. Sharon Ruschkoski, director of a PSM program in

bioinformatics at the University of British Columbia. In attendance were fifteen faculty and administrators from the regional campuses at Tri-Cities, Vancouver, and Spokane, along with hosts from WSU Pullman. Presenters included representatives of the WSU graduate school, and Chris Riveria, Director of the Washington Biotechnology Biomedical Association. This workshop immediately stimulated interest and cemented the drive to develop a system-wide PSM at WSU.

The adoption of a system-wide PSM degree at WSU offers multiple “win-win” situations for both urban and rural populations and the economy: 1) a win for the student, as this is an alternative way to remain in science without following a traditional science graduate degree; 2) a win for University faculty in that they will be teaching and mentoring highly motivated students on their path to interdisciplinary graduate degrees and high likelihood of employment; 3) a win for employers in that they will have a local, highly trained pool of A potential employees; and 4) a win for the local community in that the number of community members with graduate degrees will increase.

ⁱ NPSMA National Professional Science Master’s Association, accessed at <http://www.sciencemasters.com/Default.aspx?tabid=58>

ⁱⁱ Council of Graduate Schools, Advocacy, Research and Innovation, accessed at http://www.sciencemasters.com/portals/0/pdfs/Guidelines_for_PSM_Affiliation.pdf

ⁱⁱⁱ Key facts about Higher Education in Washington, accessed at <http://www.hecb.wa.gov/keyfacts/documents/KFChapterV.pdf>

^{iv} Washington Quick Facts from the US Census Bureau accessed at <http://quickfacts.census.gov/qfd/states/53000.html>

^v Journal of Physics, this article originally appeared in the June 2010 issue of *Physics World* http://www.journalofphysics.org/careers/workinglife/articles/page_45443.html