

**DATE:** April 25, 2013

**SUBJECT:** New Academic Program, Tennessee Technological University  
Professional Science Masters (concentration in Environmental Informatics)

**ACTION RECOMMENDED:** Approval

**BACKGROUND INFORMATION:** The proposed Professional Science Masters (PSM) program with a concentration in Environmental Informatics focuses on analytical and computer-based methods in the study and management of natural resources and the environment. The Professional Science Master's is a unique professional degree grounded in natural science, technology, engineering, mathematics and computational sciences and is designed to prepare students for direct entry into a variety of career options in industry, business or government. It is a distinctive advanced degree for those intending to pursue a career in the practice of science.

Since 2006, the Council of Graduate Schools endorsed the PSM program model and currently over 100 institutions have developed these interdisciplinary graduate programs that are characterized by science and mathematics with skills-based courses in management and leadership with an internship component. The proposed PSM program with a concentration in Environmental Informatics meets all those criteria and will seek PSM recognition from the Council.

**PROPOSED IMPLEMENTATION DATE:** Fall 2013

**1.1.20A MISSION:** The proposed program aligns very well with the vision and mission of Tennessee Technological University as the State's comprehensive university known for offering high-quality programs in the STEM disciplines that produce graduates in an area of state and national need. Furthermore, the degree program will fulfill the educational goal of TTU's Center of Excellence for the Management, Utilization and Protection of Water Resources.

The PSM program with a concentration in Environmental Informatics is in alignment with the goals outlined in the THEC 2010-15 Public Agenda for Higher Education, specifically the focus on strengthening Tennessee's Knowledge Economy and increasing the number of graduate degrees awarded to the state's citizen.

**1.1.20B CURRICULUM:** The degree program will require completion of 33 semester credit hours, including a 12-hour major field core, 18 hours in the concentration and a 3-hour elective. The curriculum is designed based on the model prescribed by the Council of Graduate Schools in order to be recognized as a "Professional Science Master's" program. Curriculum requirements mandate that the majority of course content be derived from STEM disciplines

and the inclusion of a capstone project supervised collaboratively by faculty and employers.

Courses will be delivered online and on-campus and this hybrid mode of delivery is more cost-effective since most of the courses currently exist.

**1.1.20C ACADEMIC STANDARDS:** Program admission requires a bachelor’s degree; a minimum 3.0 overall undergraduate GPA; satisfactory scores on the Graduate Record Examination (GRE); and three letters of recommendations.

Students must meet progression and graduation standards as published annually in the TTU catalog.

**Projected Program Enrollment and Productivity**

Students will have the option to attend the program on either a part-time or full-time basis.

<b>Year</b>	<b>Full-Time Enrollment</b>	<b>Part-Time Enrollment</b>	<b>Total Headcount</b>	<b>Graduates</b>
<b>2013</b>	6	3	9	--
<b>2014</b>	12	6	18	6
<b>2015</b>	14	12	26	6
<b>2016</b>	16	17	33	8
<b>2017</b>	20	20	40	8

**1.1.20D FACULTY:** The PSM program will use an interdisciplinary approach by incorporating existing faculty from the Colleges of Business, Arts and Sciences and Engineering. All faculty involved have their terminal degree in their respective fields.

**1.1.20E LIBRARY RESOURCES:** Library resources are adequate for program implementation.

**1.1.20F ADMINISTRATION/ORGANIZATION:** This program will be offered through the School of Environmental Studies (SOES) located within the College of Interdisciplinary Studies. The SOES Director will also serve as the program director for the proposed Professional Science Master’s program.

**1.1.20G SUPPORT RESOURCES:** Students will have access to a wide range of support resources, including advising support from the program director and other faculty members.

**1.1.20H FACILITIES AND EQUIPMENT:** Facilities and instructional equipment are adequate to support the program. Additionally, TTU will purchase a license agreement to make GIS software available across campus.

**1.1.20I NEED AND DEMAND:** The Bureau of Labor Statistics projects that by 2018, close to 110,000 environmental scientists and specialists jobs will be available. This represents a 28 percent increase since 2008 with 86,000 jobs available.

As environmental issues become more complex due to population growth, pollution and limited natural resources, the PSM program with a concentration in Environmental Informatics will effectively prepare students for careers to sustain the earth's resources for future generations. Through this effort, Tennessee Tech University will become recognized as a leader in Environmental Informatics in Tennessee and the southeastern United States.

**1.1.20J NO UNNECESSARY DUPLICATION:** Currently, there are no Professional Science Master's programs in Tennessee with a concentration in Environmental Informatics. This proposed program aligns with the institution's mission and other program offerings such as the undergraduate program in Environmental and Sustainability Studies and the doctoral program in Environmental Science.

**1.1.20K COOPERATING INSTITUTIONS:** N/A

**1.120L DIVERSITY AND ACCESS:** Tennessee Tech University is committed to an inclusive and diverse campus that enriches the educational experience, promotes personal growth and a healthy society, prepares students for success in a global economy and enhances America's economic competitiveness.

**1.1.20M ASSESSMENT/EVALUATION AND ACCREDITATION:** There are no accrediting agencies for this specific program; however, the program is structured based on the PSM guidelines established by the Council of Graduates Schools. The College of Interdisciplinary Studies plans to seek recognition of the PSM program through the Council. A Professional Science Master's recognition provides assurance that the program conforms to nationally accepted criteria.

Program effectiveness will be gauged by annual data collection of enrollment, degree completion, and demographics; and the employment history of graduates. Additionally, the program faculty committee will review the assessment results and determine if any revisions to the program is warranted. Program revisions will be shared with the Industrial Advisory Board for feedback.

**1.1.200 EXTERNAL JUDGMENT:** External review of the proposed program was conducted during an institution site visit on November 13-14, 2012. Dr. Randy Dymond, Associate Professor of Civil and Environmental Engineering at Virginia Tech University served as the external reviewer. He recommended the proposed PSM program with a concentration in Environmental Informatics for approval and noted the following strengths:

- A supportive university administration that recognizes the difficulties and advantages of interdisciplinary programs.
- A supportive, collaborative, and qualified faculty that represents a myriad of departments that would contribute to the program.

- A proposed director with significant environmental engineering experience and directorship experience.
- A university track record of strong programs in the collective areas of specialty
- A relatively low cost of implementation.
- Good university level information technology and library resources.
- An employment market that will support the graduates of the program.

**1.1.20P COST/BENEFIT:** The proposed PSM program will be funded through campus reallocations and additional tuition revenues generated by the program.

**1.1.30 POST APPROVAL MONITORING:** An annual performance review of the proposed program will be conducted for the first five years following program approval. The review will be based on benchmarks established in the approved proposal. At the end of this period, the campus, governing board, and Commission staff will perform a summative evaluation. The benchmarks include, but are not limited to, enrollment and graduation, program cost; progress toward accreditation and other metrics set by the institution and agreed upon by governing board and Commission staff. If benchmarks are not met during the monitoring period, the Commission may recommend that the governing board terminate the program. If additional time is needed and requested by the governing board, the Commission may choose to extend the monitoring period.