

DATE: April 25, 2013

SUBJECT: New Academic Program, Austin Peay State University
Professional Science Masters (concentrations Data Management
& Analysis and Predictive Analytics)

ACTION RECOMMENDED: Approval

BACKGROUND INFORMATION: Many managers find themselves making decisions based on the analysis of data knowledge of statistical and mathematical tools for developing detailed measures or trends based on historical data. The proposed Professional Science Masters (PSM) program with concentrations in *Data Management and Analysis* and *Predictive Analytics* will provide that training and provide these managers with additional credentials that will support advancement in their field of expertise.

The proposed degree follows the PSM model of integrating professional business skills with the STEM disciplines. 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 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 concentrations in *Data Management and Analysis* and *Predictive Analytics* meets all those criteria and will seek PSM recognition from the Council.

PROPOSED IMPLEMENTATION DATE: Fall 2013

1.1.20A MISSION: The proposed program supports Austin Peay State University's mission of "raising the education attainment of the citizenry, developing programs and services that address regional needs, and providing collaborative opportunities that connect university expertise with private and public resources." The PSM program 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 closing the gaps in the supply of graduates in high demand fields that require post-secondary credentials, particularly in the STEM fields. The concentrations being proposed in *Data Management and Analysis* and *Predictive Analytics* are designed to prepare graduates to meet the workforce needs of this region.

1.1.20B CURRICULUM: The degree program will require completion of 30-36 semester credit hours depending on PSM concentration. 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. The PSM program will be a fully online degree program. Offering the degree program entirely online will have the added benefit of preparing the PSM students for the challenges of working as part of a team using project management software tools.

PSM Program Structure by Concentration

	Data Management and Analysis	Predictive Analytics
General Core	9 credits	9 credits
Major Field Core	9-12 credits	9-12 credits
Concentration	12 credits	15 credits
Total	30 – 33 credits	33 – 36 credits

1.1.20C ACADEMIC STANDARDS: Program admission requires a bachelor’s degree; satisfactory scores on the Graduate Record Examination (GRE); two letters of recommendations; and a personal essay. The academic transcript or work experience of successful applicants must include evidence of aptitude, knowledge, and skill in algebra, quantitative literacy and foundation of computer programming.

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

Projected Program Enrollment and Productivity

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

Year	Full-Time Enrollment	Part-Time Enrollment	Total Headcount	Graduates
2013	6	15	21	--
2014	14	30	44	6
2015	16	39	55	8
2016	16	45	61	23
2017	16	45	61	23

1.1.20D FACULTY: The PSM program will use an interdisciplinary approach by incorporating existing faculty from the different colleges at APSU. Faculty in the College of Arts and Letters and the College of Behavioral and Health Sciences will teach the core courses. Courses in the two program concentrations will be taught by faculty in the College of Science and Mathematics. 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: The PSM concentration in *Data Management and Analysis* will be offered within the Department of Computer Science and Information Technology. The PSM concentration in *Predictive Analytics* will be offered within the Department of Mathematics and Statistics. Both departments are in the College of Science and Mathematics.

Program oversight will be coordinated by the two PSM Coordinators for each concentration and the Program Director. It is feasible that one of the PSM Coordinators may serve as the director.

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

1.1.20H FACILITIES AND EQUIPMENT: Facilities and instructional equipment are adequate to support the program. Additionally, software products needed for the PSM program are industry standards, most of which are currently funded by the technology access fee.

1.1.20I NEED AND DEMAND: According to the THEC supply and demand projections for Tennessee, the business analysis pathway is expected to have a shortfall of available trained employees by 2018, with a projected supply to demand ration of .88. Similarly, a shortfall is projected for the Information Support and Services Pathway. The PSM program will have a large statistical component, including coursework in regression, data mining and time series. According to the Bureau of Labor Statistics, the employment of statisticians is expected to grow 13 percent from 2008 to 2018. Additionally, the field of data mining and predictive analytics has grown exponentially in recent years. The Dice.com (leading website for technology industry) presently lists 1,000 job openings nationally in data mining and predictive modeling.

The proposed PSM program will produce individuals with the necessary skills to manage data (*Data Management and Analysis*) and to make predictions using large data sets (*Predictive Analytics*). The demand for individuals with the ability to manage data and use data to make prediction is only going to grow. Austin Peay State University is posed to be a leader in the fields of data management and predictive analytics.

1.1.20J NO UNNECESSARY DUPLICATION: Currently, there are no Professional Science Master's programs in Tennessee with concentrations in *Data Management and Analysis* and *Predictive Analytics*. The only program similar to the two PSM concentrations being proposed is the Business Analytics, Master of Science program at University of Tennessee, Knoxville. The program at UTK is focused on business while the individuals that would be most interested in the Predictive Analytics concentration at APSU would be graduates from computer science and mathematics.

1.1.20K COOPERATING INSTITUTIONS: N/A

1.120L DIVERSITY AND ACCESS: Austin Peay State University is an equal opportunity employer committed to the education of a non-racially identifiable student body. Accordingly, the student recruitment plan for the PSM program will be developed to target a diverse potential student cohort.

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. Austin Peay State University 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 Advisory Board for feedback.

1.1.20O EXTERNAL JUDGMENT: External review of the proposed program was conducted during an institution site visit on November 19-20, 2012. Dr. S. Lynne Stokes, Professor of Statistical Science at Southern Methodist University served as the external reviewer. She recommended the proposed PSM program with concentrations in *Data Management and Analysis* and *Predictive Analytics* for approval and noted the following strengths:

- The time is right for a program of this sort. Recent publicity of about the analysis of “big data” ... has created an awareness of and appreciation for data analysis that is unprecedented in my professional lifetime.
- The on-line format provides a competitive advantage among the new degree programs in data management and analysis that are springing up. Furthermore, its infrastructure and experience in on-line curriculum delivery makes APSU well positioned for this format.
- The internship component is an important part of this program. The relationships developed through the internship experience in the undergraduate computer science program provide evidence that this component will be feasible to implement.
- There is a strong administrative support for the program all the way from department chairs to the provost.
- The current provost's high visibility and success using the techniques to be taught should help in recruiting and placing students, as well as finding internship placements.

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.