REQUEST FOR AUTHORIZATION TO IMPLEMENT A
BACHELOR OF SCIENCE IN DATA SCIENCE AND PREDICTIVE ANALYTICS
AT UW-RIVER FALLS
PREPARED BY UW-RIVER FALLS

ABSTRACT

The University of Wisconsin-River Falls proposes to establish a Bachelor of Science (B.S.) in Data Science and Predictive Analytics. This program responds to the strategic direction of the university, to student and alumni interest, and to employer and employee interest in the metropolitan St. Croix River Valley region, and the state of Wisconsin. Establishing the program will provide students with a high-quality degree in an emerging interdisciplinary field with high demand and prospects for graduates (whether entering the workforce or seeking graduate/professional school opportunities). The goal of the program will be to provide students with the skill and knowledge sets required to work in solution-oriented contexts, across a number of professional fields and contexts. Graduates of the program will be in high demand as information and data needs continue to grow across nearly all industry sectors. The program will be comprised of 72 to 75 credits, a core of which will be drawn from the Computer Science & Information Systems and Mathematics departments and options from other departments/programs.

PROGRAM IDENTIFICATION

Institution Name
University of Wisconsin-River Falls

Title of Proposed Program
Data Science and Predictive Analytics

Degree/Major Designations
Bachelor of Science

Mode of Delivery
Single institution; combining face-to-face, hybrid (low residency), and online instruction.

Projected Enrollments by Year Five

<table>
<thead>
<tr>
<th>Year</th>
<th>Implementation Year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
</tr>
</thead>
<tbody>
<tr>
<td>New students admitted</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Continuing students</td>
<td>19</td>
<td>38</td>
<td>50</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Total enrollment</td>
<td>25</td>
<td>49</td>
<td>73</td>
<td>85</td>
<td>100</td>
</tr>
<tr>
<td>Graduating students</td>
<td>4</td>
<td>15</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table above identifies the projected enrollment patterns for the program, and attempts to capture variations in first to second; first to third; and graduate rates. However, there is some
elasticity related to graduation rate and time to degree predicated on students entering with dual enrollment or other forms of college credit. While UWRF remains conservative with a 75% first to second year retention rate the university is more optimistic beyond this because it see the program as a unique destination program.

Tuition Structure
UW-River Falls has used standard undergraduate tuition pricing and revenue to calculate the tuition structure for the new program. The 2014-15 Wisconsin tuition rate is $267.75 per credit and the plateau tuition (for 12-18 credits) is $3,214.50 per semester.

Minnesota reciprocity tuition is $283.26 and $3,399.12 for the plateau (each semester).

Segregated fees for all full-time undergraduate students are $661.67 per semester for 2014-2015. Depending on actual courses taken, particularly among the elective and cognate lists, there may be additional individual course fees.

Department or Functional Equivalent
The proposed program will be managed within the department of computer science and information systems, with an advisory group of faculty from the departments with cognates embedded within the program.

College, School, or Functional Equivalent
The proposed program will be housed within the College of Business and Economics.

Proposed Date of Implementation
Spring 2016

INTRODUCTION

Rationale and Relation to Mission
The undergraduate program in data science is a natural outgrowth of the university’s strengths in Computer Science and Mathematics. In addition the first generation of cognate areas also come from strong academic programs that cut across the university’s strengths in the basic and applied sciences as well as professional fields (i.e. business administration areas). UW-River Falls sees its purpose as serving as an access university that provides undergraduate and graduate opportunities to students from the region and beyond. Befitting its purpose, the University of Wisconsin System mission states clearly, “The university provides an excellent environment for learning, emphasizing the importance of faculty-student interaction in classrooms, laboratories, academic advising and co-curricular activities.” As an institution that is part of the University of Wisconsin System University Cluster, UW-River Falls is authorized to offer baccalaureate (and other programs) across the range of liberal arts programs as well as in various professional fields. Consequently, “the university offers liberal arts programs and degrees to meet regional needs in the arts, humanities, mathematics, natural and physical sciences and social and behavioral sciences. The liberal arts also strengthen and broaden programs in the agricultural sciences, teacher education, and business administration.”
The baccalaureate program in data science is consonant with the UW-River Falls’ focused mission—to help prepare students to be productive, creative, ethical, engaged citizens and leaders with an informed global perspective—and supports the first goal, distinctive academic excellence, of the university’s strategic plan (Pathway to Distinction).

Finally, given the focus of the degree program, UW-River Falls predicts that the students and faculty engaged in the curriculum will also be engaged with and support the university’s efforts to partner with entities in the region focused on economic and workforce development.

Need as Suggested by Current Student Demand

Development of the program was encouraged by the common and public messages regarding the need for graduates who can manage data and work with businesses, agencies, and other entities who use large data sets. This initial interest in the possibility of an undergraduate program was then shaped and reinforced by a study conducted by Hanover Research, who was asked to look at student and market demand.

The Hanover Research findings note that data science remains an emerging and interdisciplinary field. However, among its key findings Hanover observes, “Indicators suggest that the number of data science degree completions is expanding both nationally and regionally. Between 2008 and 2012, completions in programs related to data science, such as Information Sciences/Studies and Data Modeling/Warehousing and Database Administration increased on a yearly basis. Such growth reflects interest in the topics of data science and analytics, and suggests that such programs may also be growing” (p. 3)

The data across disciplines typically associated with areas of data science show general positive growth across the most recent five years for which data was available when the study was conducted.

UW-River Falls is in a border region near a number metropolitan and suburban high schools that are focused on science and mathematics and these would serve as obvious recruitment sites for first-time, first-year students. Similarly, the university has nearly 20 two-year institutions within 50 miles of River Falls and these colleges could provide ready access to students in transfer-ready programs across mathematics, computer science, information science, and decision science fields.

Need as Suggested by Market Demand

In the 2013 report, Game Changers: Five Opportunities for US Growth and Renewal, the McKinsey Global Institute observed that there are several emerging areas that can help drive the US economy, among them McKinsey “identifies game changers in energy, trade, big data, infrastructure, and talent” (p. 1). McKinsey further notes that data (or big data) is not simply an industry unto itself but also a part of a broader opportunity for nearly all industry sectors: “Big data can play a role in raising the productivity of knowledge-intensive manufacturing for export, maximizing infrastructure assets, and facilitating new personalized digital learning tools” (p. 3) and, consequently, “A talent revolution is needed to train tomorrow’s energy engineers and big
data analysts, as well as the skilled workforce needed for a 21st-century knowledge economy” (p. 3). This emphasis on data science and the management of data sets and knowledge is also reinforced in the Hanover Research study:

Several recent news articles and employment reports discuss the growing popularity and demand for data analysts at companies throughout the nation. In a June 2013 article for CNBC, one CEO explains, “The desire on the enterprise side to find truly qualified data scientists has resulted in almost open headcount. It’s probably the biggest imbalance of supply and demand that I’ve ever seen in my career… The talent pool is, at best, probably 20 percent of the demand.”13 The article discusses the high demand for qualified jobseekers in a variety of industries, and notes the high salary offerings for these individuals. (p. 14)

The outlook for data science and the need for graduates with skills and abilities to harness the potential for data use leads Hanover Research to conclude that

Due to this increased focus on data analytics, a 2013 report by Gartner found that IT departments spend approximately $34 billion on big data in 2013, with nearly half of the investments focused on social media analysis and content analysis.15 These statistics indicate that companies across several industries are seeking to hire qualified individuals with an understanding of data analytics and interpretation. (p. 14)

UW-River Falls seeks to offer the baccalaureate degree in data science as a means to contribute to the needs of businesses, large and small, as well as those needs found among service agencies, the military, local, state, and national government. In reviewing the specific demands for the state and region, Hanover Research was able to conclude that “At the state level, all data science-related occupations are projected to grow through 2020, and again over half of these occupations are slated to grow faster than the state average (11.9 percent)” (p. 10). More focused in the region nearer to the UW-River Falls campus, “occupations related to data science are predicted to grow in the west central region of Wisconsin through 2020” (p. 11). For the Twin Cities area, Hanover indicates that “overall, occupations related to data science are projected to grow in the Twin Cities region” (p. 13).

Given the local, regional, and national information, UW-River Falls is confident that the demand for graduates in data science is only going to grow and the field matures and that the present demand warrants pursuing the major.

DESCRIPTION OF PROGRAM

General Structure

The degree program will be built upon the foundation of the university’s general education curriculum and with a substantial core component of lower and upper division mathematics and computer science courses. Students will then be advised to seek a relevant option (area of emphasis) that tracks a particular field of study or professional domain (such as Finance, Geographic Information Systems, Marketing/Management).

Institutional Program Array

The program will fit well with other mathematics, science, and professional disciplines and has the potential to include additional cognates (such as bioinformatics, decision science,