AGENDA

UW-GREEN BAY FACULTY SENATE MEETING NO. 6
Wednesday, January 28, 2015
Alumni Rooms, 3:00 p.m.
Presiding Officer: John Lyon, Speaker
Parliamentarian: Clifford Abbott

1. CALL TO ORDER

2. APPROVAL OF MINUTES OF FACULTY SENATE MEETING NO. 5
December 3, 2014 [page 2]

3. CHANCELLOR'S REPORT

4. NEW BUSINESS

a. Essential Job Functions [page 5-7]
Presented by Lynn Niemi and Sheryl Van Gruensven

b. Masters of Data Science [page 8-30]
Presented by Scott Furlong and Gaurav Bansal

c. Change to Individualized Learning Committee [page 31]
Presented by Steve Meyer

d. Request for future business

5. PROVOST'S REPORT

6. OTHER REPORTS

a. Faculty Rep's Report - Presented by Steve Meyer
b. University Committee Report - Presented by Steve Meyer
c. Academic Staff Report - Presented by Josh Goldman
d. Student Government Report - Presented by Vanya Koepke

7. ADJOURNMENT

[approved]

MINUTES 2014-2015
UW-GREEN BAY FACULTY SENATE MEETING NO. 5
Wednesday, December 3, 2014
Phoenix Room C, University Union

Presiding Officer: John Lyon, Speaker of the Senate
Parliamentarian: Clifford Abbott

PRESENT: Greg Aldrete (HUS), Andrew Austin (DJS), Dallas Blaney (PEA), Toni Damkoehler (AND), Hernan Fernandez-Meardi (HUS), Clifton Ganyard (HUS-UC), Doreen Higgins (SOCW), Jenell Holstead (HUD), Mimi Kubsch (NUR-UC), Jim Loebl (BUA), Kaoime Malloy (Theatre and Dance), Ryan Martin (HUD), Michael McIntire (NAS), Steve Meyer (NAS-UC), Gary Miller (Chancellor, ex officio), Cristina Ortiz (HUS-UC), Debra Pearson (HUB), Uwe Pott (HUB), Courtney Sherman (MUS), Brian Sutton (HUS), Linda Tabers-Kwak (EDU), Patricia Terry (NAS), Christine Vandenhouten (NUR), Kristin Vespia (HUD-UC), Amy Wolf (NAS).

NOT PRESENT: Adolfo Garcia (ICS), Ghadir Ishqaidef (BUA), Ray Hutchison (URS), Arthur Lacey (EDU), Alison Stehlik (AND)

REPRESENTATIVES: Vanya Koepke, Student Government

GUESTS: Scott Furlong, Sue Mattison, Lucy Arendt, Greg Davis, Paula Ganyard

1. CALL TO ORDER.
The senators made an impatient Speaker Lyon wait until a quorum was present for him to call the meeting to order at 3:05 p.m.

2. APPROVAL OF MINUTES for Faculty Senate Meeting No. 4, November 12, 2014.
The Speaker asked for corrections and, hearing none, declared the minutes accepted.

3. CHANCELLOR'S REPORT.
The Chancellor apologized for having to leave the meeting early but he did stress the importance of the UW-System SWOT analysis, an item on this meeting's agenda, for its potential impact on a larger reform effort going on at the System level. He then asked for questions and he got two, both concerned with the University's response to articles in the press, one about salaries and overloads and the other about the effect of private giving on state funding. He answered that

there had been a coordinated decision not to respond in public but rather to target a different audience, largely key state legislators, where groups such as the Advocacy Committee of the Chancellor's Council of Trustees might have more persuasive clout. There is an expectation of criticism from some legislators on faculty workload issues and much needs to be done to educate both the public and the legislators about faculty's non-instructional workload, but for the time being those discussions will be targeted at select legislators rather than the general public.

4. NEW BUSINESS

a. Realignment of Summer Terms. UC Chair Meyer presented this item, reminding the senators that they had been sent some background material and a number of arguments about the proposed change. He also handed out some data on summer enrollment patterns. At the invitation of the Speaker, **Senator Terry (Senator Ortiz second) moved to endorse the proposed change**. There were clarifying questions and arguments on both sides. Several senators presented reasons that their programs needed, or at least wanted, the flexibility in the status quo. Among them were Nursing and Social Work because of start dates, Human Biology because of travel courses and expected work with the Medical College of Wisconsin, and Modern Languages and Music to provide continuity of sessions. There were arguments on how actively the University should protect students from making choices that might overload them. There was also a general admission that the current arrangement was administratively complex even if it was pedagogically flexible. The SGA representative confirmed some student confusion about rules and deadlines and even the ability to get accurate information from the Registrar's Office on those deadlines. In the end **the Senate voted (10-13-0)** deciding not to endorse the proposal.

b. Request for Future Business. It was slightly out of sequence but two issues eventually emerged. One was a request to review whether/how on-line discussions should count as "public discourse" for writing emphasis courses. The other was a request for an update of the "essential job functions" issue from last year that had been referred to the Committee on Disability Issues. The Speaker promised the UC's attention to both items.

5. OTHER REPORTS

a. Academic Affairs Council Report. This was attached to the agenda in written form.

b. University Committee Report. UC Chair Meyer reported progress on a proposal for administrator evaluations. Reps from the three governance groups (Faculty, Academic Staff, and University Staff) had met. The UC will also be taking up the issue of the role of administrators with faculty positions in faculty governance since current Code is not consistently clear on what they may and may not do. He also reported that time constraints had prevented faculty input on the harassment prevention training vendor selection issue (criticism from language mavens is welcome on the difficulties in parsing a sequence of six nouns).

c. Academic Staff Report. There was no representative available for the report.

d. Student Government Report. Representative Koepke reminded the Senate of the state of the campus address to be held that evening and a meeting in Marinette on influencing the funding of higher education in the next state budget. He also hoped that basketball successes could translate into enrollment increases.

6. OPEN FORUM

The issue was to identify strengths, weaknesses, opportunities, and threats for the UW-System. The results of this session would be forwarded along with others at UW-Green Bay and from other System stakeholders to be part of a reform effort for the System. Some of the issues presented by senators could be viewed in more than one of the four categories depending of your perspective but here is a listing of what the discussion generated.

Strengths: a strong academic and research reputation; a progressive tradition; attractively stable pension funding; shared resources such as the library and teaching scholars program; geographical access for the state's citizenry; System's ability to help individual campuses with emergencies; System efforts to foster faculty development and student learning

Weaknesses: lack of state financial support; low salaries; missed opportunities for collaboration (sometimes because of lack of awareness, sometimes because Madison seems to get the lion's share); communication inefficiencies; a perception that UW degrees don't contribute as much to the economy as tech school degrees; too many costly layers of System administration making curricular change difficult; administrative tasks that could be done centrally are left to the campuses (negotiating on-line contracts with other states, facilitating graduate admissions beyond just a common form, credit transfer complexities, separate tuitions)

Opportunities: better sharing of resources and collaborations (on-line education, FLEX option, credit for prior learning, undergraduate research); educating legislators; better serving of underserved populations; building partnerships with private sector, local government, and K-12 education; promoting the value of liberal arts; differentiating UW from tech schools

Threats: costs of turnover due to low salaries; the political environment (disinvestment by state, attacks on teaching, lack of valuing of arts and humanities); costs of higher education in general, which leads to student debt, which leads to an overly vocational mindset; campus competition both within the System and from privates and for-profits; public perceptions (about workload, what tuition pays for, how state-supported public higher education is, and relative costs of public education vs for-profit schools).

7. ADJOURNMENT

Speaker Lyon adjourned the meeting at 4:25 p.m.

Respectfully submitted,

Clifford Abbott, Secretary of the Faculty and Academic Staff

Proposed Essential Job Functions for Tenured/Tenure-Track Faculty

- Designs and teaches in a classroom setting, online or in the field, required courses as assigned.
- Prepares, reviews, orders teaching materials, and updates course outlines and syllabi.
- Meets all scheduled classes, and uses scheduled classroom time appropriately.
- Demonstrates commitment to the institutional and department mission, goals and objectives.
- Adheres to University policies and procedures that reflect updated Federal, state and local legislation that governs the educational process.
- Creates and maintains accurate student records in accordance with department policies and Family Educational Rights and Privacy Act (FERPA) regulations as it relates to student educational records.
- Reads, reviews and evaluates student course or academic work; grades assignments, tests and exams in a timely manner; monitors attendance and adherence to department academic requirements or course requirements; submits grade reports within college deadlines.
- Schedules and maintains office hours according to department policy.
- Attends departmental and other meetings as designated by the Department Chair or administrative official.
- Assists in the development, implementation, and evaluation of divisional and departmental program goals.
- Serves on university committees to which elected or appointed.
- Supervises, monitors, and evaluates student teachers' performance when assigned to do so.

- Establishes a scholarly research focus and engages in research and other scholarly projects, resulting in peer-reviewed publications or other scholarly output appropriate to the faculty member's budgetary unit.

- Performs academic and professional service to advance the university, college and community.

- Participates in faculty governance.

- Demonstrates a professional and respectful attitude, philosophy, and commitment toward teaching, service and research; acts professional and respectful toward other colleagues, staff and students; conducts work in a manner that promotes student growth and learning.

- Uses instructional technology and be familiar with appropriate software and hardware based on department needs.

- Transports oneself to various on and off campus locations when required.

- Communicates in a professional, effective and timely manner with students, colleagues, staff and the public.

UNIVERSITY of WISCONSIN
GREEN BAY
360° OF LEARNING

MEMO

TO: Dr. Steven Meyer
University Committee Chair

FROM: Committee on Disability Issues
Greg Smith and Lynn Niemi, Co-Chairs

RE: Faculty Essential Job Function

DATE: December 4, 2014

On behalf of the UW-Green Bay's Committee on Disability Issues, we appreciated the chance to review the proposed Essential Job Functions document for faculty. Our committee met to review the document for the purpose of evaluating whether any portion might put people with disabilities at an unwarranted disadvantage or if the document might be out of compliance with federal and state disability related regulations. Since essential job functions are the basic job duties that an employee must be able to perform, with or without reasonable accommodation, our committee supports all university job descriptions to have essential job functions identified.

We have attached the updated the document dated December 2, 2014 along with the original document dated February 10, 2014 so you can see our changes. We have included The U.S. Equal Employment Opportunity Commission's - The ADA: Your Responsibility as an Employer for your review.

Please contact us if you have any question or need any further assistance. Thank you.

CC: Daniel Speilmann, Chief of Staff

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REQUEST FOR AUTHORIZATION TO IMPLEMENT A

COLLABORATIVE ONLINE MASTER OF SCIENCE DEGREE IN DATA SCIENCE

University of Wisconsin-Eau Claire

University of Wisconsin-Green Bay

University of Wisconsin-La Crosse

University of Wisconsin-Oshkosh

University of Wisconsin-Stevens Point

University of Wisconsin-Superior

With administrative and financial support from the University of Wisconsin-Extension

ABSTRACT

The University of Wisconsin-Extension, on behalf of the above-defined academic partners, proposes to establish an online *Master of Science degree in Data Science (M.S. in Data Science)*. This program responds to the emergence of data science as one of the fastest growing professions and academic disciplines in the 21st century. Research suggests that the demand for data scientists exceeds the current supply of trained professionals in this area, primarily because the discipline is so new. The goal of this professional degree program, as designed, is to educate data science leaders. The program will prepare students to derive insights from real-world datasets, using the latest tools and analytical methods, and to interpret and communicate their findings effectively. The program features a multidisciplinary curriculum that draws primarily from computer science, math and statistics, management, and communication. The program represents a fixed curriculum comprising 36 credits (12 three-credit courses) to include a required capstone course, which represents the culminating experience for students.

PROGRAM IDENTIFICATION

Title of Proposed Program

Master of Science in Data Science

Mode of Delivery

Collaborative online degree program

Projected Enrollments by Year Five

Table 1 represents enrollment and graduation projections for students entering the program over the next five years and is based, in part, on experience with similar University of Wisconsin online programs. As shown, we are anticipating strong enrollments with 208 students enrolling in the program and 95 students having graduated from the program by the end of year five. For the purpose of this model, it is anticipated that the annual attrition will be moderate—15 percent—for students moving through the program. The projections in this chart are conservative, assuming that all students who remain in the program after their first year will graduate.

Table 1: Five-Year Projected Student Enrollments

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New	63	44	35	33	33
Continuing		54	91	121	149
Total	63	98	126	154	182
Graduating		5	10	40	40

Tuition Structure

Program tuition for the M.S. in Data Science program will be set at $825/credit for 2015–2016 and will be identical at all six partner institutions. This fixed tuition rate is based on market demand estimates as well as comparisons with other online programs in the UW System and nationally, and will be charged outside the credit plateau. This amount represents an all-inclusive fixed tuition, and students will not be charged any additional fees (such as segregated fees) as part of the program, except for the costs of their books. There is no tuition differential for out-of-state students. If students live near their home campus and wish to pay segregated fees for the

use of recreational and other facilities, they may do so. However, they will not be required to pay these fees if they do not take advantage of associated resources. This tuition-pricing approach and structure follows the current UW System pricing guidelines for distance education programs (ACIS-5.4 Revised: Programming for the Non-Traditional Market in the University of Wisconsin System, APPENDIX C: Principles for Pricing Distance Education Credit Courses, Degree and Certificate Programs).

Department, College, School, or Functional Equivalent

This is a highly collaborative, interdisciplinary program that follows a home campus model (i.e. students identify/select a home campus to receive academic supports and from which the degree is conferred). The departments and schools/colleges that will offer courses for this program at each institution are as follows:

- At the University of Wisconsin-Eau Claire, the M.S. in Data Science degree will be housed in the Department of Mathematics within the College of Arts and Sciences.

- At the University of Wisconsin-Green Bay, the M.S. in Data Science degree will be housed in the Department of Information and Computing Science and also in the Department of Natural & Applied Sciences, both within the College of Liberal Arts & Sciences.

- At the University of Wisconsin-La Crosse, the M.S. in Data Science degree will be housed in the Department of Mathematics in the College of Science and Health.

- At the University of Wisconsin-Oshkosh, the M.S. in Data Science degree will be housed in the Department of Computer Science in the College of Letters and Science.

- At the University of Wisconsin-Stevens Point, the M.S. in Data Science degree will be housed in the Department of Computing and New Media Technology within the College of Letters and Science.

- At the University of Wisconsin-Superior, the M.S. in Data Science degree will be housed in the Department of Business and Economics.

UW-Extension Division of Continuing Education, Outreach and E-Learning provides administrative and financial support for the program. UW-Stevens Point will serve as the lead institution representing the collaborative when seeking accreditation through the Higher Learning Commission (HLC).

Proposed Date of Implementation

September 2015 (tentative) pending approval by UW System and the Board of Regents.

INTRODUCTION

Rationale and Relation to Mission

The online M.S. in Data Science degree program contributes directly to the institutional mission of the University of Wisconsin System which clearly defines a commitment to "discover and disseminate knowledge, to extend knowledge and its application beyond the boundaries of its campuses." The online M.S. in Data Science provides a degree in a recognized high-need area as supported by research that included extensive input from employers throughout the state, and develops competencies that will enable graduates to contribute immediately to serve this important function and role within the Wisconsin workforce. It is a degree targeted at adult and nontraditional students possessing a bachelor's degree, and thus broadens access for alumni and others to the university environment.

The online M.S. in Data Science also supports the institutional missions of the six partner campuses by contributing to the core of liberal education by developing communication, critical thinking, problem solving, analytical skills, leadership, teamwork, and collaboration skills. Furthermore, this will be a multidisciplinary degree that helps build bridges between disciplines and develops students' abilities to think in terms of systems and interrelationships, and within complex organizations.

Current Market/Student Demand

Because of the ongoing explosion of "big" data, companies have more information available than ever before but lack the people with the training necessary to translate it in ways that better inform business decisions. A recent Education Advisory Board (EAB) Custom Research Brief (November 2012) identified significant market demand for data science/analytics professionals, including business analysts, data analysts, database administrators, software engineers, programmers, and project managers. This research was informed by the research firms' internal and online research libraries, data from other higher education institutions, current national job postings, and other industry sources. According to a recent market analysis report by McKinsey Company (McKinsey Global Institute, 2014), the United States alone faces a shortage of 140,000 to 190,000 people with analytical expertise and 1.5 million managers and analysts with the skills to understand and make decisions based on the analysis of big data. The above sources identify the most prominent employers of data scientists to include technology firms, consulting firms, government contractors, advertising, financial services, healthcare, retail, ecommerce, and social media.

In October 2013, UW-Extension facilitated an industry focus group representing ten professionals from diverse industry sectors within Wisconsin to solicit and secure their input on current industry needs and existing workforce competency gaps. In addition, six individual focused interviews were conducted with state and national professionals from within the field to include those representing prominent professional associations such as the Data Management Association International, the Wisconsin Data Management Association, and the Association for Digital Analytics. In these discussions, several common themes arose that provided justification for degree development and informed curriculum planning:

- Significant shortfall in the local and regional labor market of individuals with data science skills…Demand is overwhelming while the current talent pool is very small
- Companies having a difficult time finding data scientists with relevant skills
- Recognized gaps in existing academic programs
- Significant need for and interest in an advanced degree in the field
- Current employees in this field have degrees from multiple and diverse disciplines and receive significant on-the-job training
- Need for an advanced, high-profile, specialized degree (but not a traditional MBA)
- Degree needs to include experiential learning opportunities such as practicum, capstone experience, or internships
- Degree will need to provide students with a cross-disciplinary technical and scientific background that emphasizes mathematics (including applied and advanced statistics), computer science, communication (personal and technical), and business.

Because it is a new and emerging field and occupation, the U.S. Department of Labor Bureau of Labor Statistics (BLS) has not yet identified the job title *data scientist* as a specific occupation and, as a result, job-specific detail is not available related to compensation, employment outlook, or other established employment categories. A review of the current BLS database of occupations and related descriptions suggests a close association between a data scientist and an operations research analyst. The site identifies 2012 median pay for the operations research analyst at $72,100 per year, entry-level education as a bachelor's degree, and a 2012-2022 job outlook as 27 percent greater than average.

A national Data Scientist Study conducted by EMC², an international consulting firm, concludes that despite the growing opportunity, demand for data scientists is outpacing the supply of talent and will do so for the next five years. The study also identified that 64 percent of companies responding identified a lack of training and resources as the biggest obstacle to data science adoption within their organizations. This translates to increasing frustration as organizations struggle to deal with and make sense of an exponentially growing volume of data. It is clear, data scientists—those with the technical abilities and analytical skills required to derive meaning from all the information—are in high demand.

One of the many recognized and significant benefits of the collaborative program model is the extended reach or scope of contacts provided through the involvement of multiple academic partners located within unique markets throughout the state. Our academic partners have established significant

relationships, reputation, and strength-of-brand within their individual regions, which will help raise awareness of this opportunity throughout the state and expand program reach. This will ultimately result in greater success in reaching and serving students, supporting regional business needs and interests, and promoting program growth and positioning it for sustainability.

It is anticipated that prospective students will present with diverse backgrounds and experiences. Based on input received from industry focus group participants (several of whom self-identified as prospective students in the M.S. in Data Science program), the majority of their recent job applicants held completed undergraduate degrees in the areas of computer science, math/statistics, business, and engineering. Industry contacts also shared that, because of a lack of formal academic programs and training in the data science area, the majority of their employee training is occurring in-house (what they referred to as home-grown talent). They also identified limited internal resources to provide ongoing and comprehensive training. All of the industry contacts shared that they would refer employees, as appropriate, to the program, and most identified having some level of tuition reimbursement support available through their organization.

DESCRIPTION OF PROGRAM

General Structure

The online M.S. in Data Science degree program will focus primarily on adult and nontraditional students who hold an undergraduate degree and have the desire to continue their education toward a graduate degree, primarily to expand knowledge and specialized skills in this area and for career advancement. The multidisciplinary curriculum has been designed to prepare data science professionals to solve real-world problems as part of an interdisciplinary team using structured and unstructured data. A listing of program competencies and outcomes has been provided later in this document.

The M.S. in Data Science is a fully online 36-credit (12 three-credit courses to include a capstone course) graduate program offered jointly by UW-Eau Claire, UW-Green Bay, UW-La Crosse, UW-Oshkosh, UW-Stevens Point, and UW-Superior. The program follows a home-campus model. Students will apply to one of the six partner institutions. Upon a student's admittance, that institution will become the student's administrative home for the degree through graduation.

The program will have an academic director at each institution, and each campus will host two courses in the curriculum. Students will receive academic advising regarding admission and graduation requirements, and financial aid through their home institution. Faculty and academic advisers at each institution will offer virtual office hours and online chat capabilities, as well as access by telephone and email. Students will have online library access through the home institution.

UW-Extension will provide administrative and financial support to the program. A program manager will be housed at UW-Extension and will work in concert with student services staff at the six partner institutions to provide general program information, problem resolution, and career advising online, by phone, or in person (for students near Madison). The program manager will be in close contact with the enrolled students and with the academic program directors to provide the hands-on active support that has been shown to be important for adult and nontraditional learners. Students enrolled in this program will have access to an extensive array of online student services including writing labs, learning readiness assessments, and career advising offered by UW-Extension.

Program Content

During the summer of 2014, the M.S. in Data Science curriculum development workgroup, made up of faculty from each of the partner institutions, dedicated significant time to the development of a targeted and powerful program curriculum. This process and ultimate product were significantly enhanced with input from representatives from diverse industry sectors including financial services, retail, insurance, manufacturing, healthcare, and education. The curriculum closely complements what have been identified as typical data science tasks. These tasks include, but are not limited to the following:

- identify and interpret rich data sources
- process and manage large amounts of data, the merging of data sources
- ensure consistency, integrity and security of datasets
- create meaningful visualizations to aid in understanding data
- build and apply mathematical models in using and processing the data
- present and communicate the data insights/findings to diverse expert and non-expert audiences

Specific program competencies and outcomes have been developed by the curriculum planning workgroup and summarized below.

Student Learning Outcomes

Competencies and associated learning outcomes for the program are represented as follows.

Competency A: Identify and assess the needs of an organization for a data science task.

- Students will be able to conduct a needs assessment.
- Students will be able to frame tasks in the context of organizational goals.
- Students will be able to communicate data science options and limitations that could meet organizational needs.

Competency B: Collect and manage data to devise solutions to data science tasks.

- Students will be able to collect, clean, and prepare data.
- Students will be able to evaluate data in terms of source, volume, frequency, and flow.

Competency C: Select, apply, and evaluate models to devise solutions to data science tasks.

- Students will be able to identify and classify relevant variables for data science tasks.
- Students will be able to choose and apply tools and methodologies to solve data science tasks.
- Students will be able to assess the model used to solve data science tasks.

Competency D: Interpret data science analysis outcomes.

- Students will be able to interpret data, extract meaningful information, and assess findings.
- Students will be able to evaluate the limitations of data science findings.

Competency E: Effectively communicate data science related information effectively in various formats to appropriate audiences.

- Students will be able to write, format, disseminate, and orally communicate technical materials.
- Students will be able to help non-technical professionals visualize, explore, and act on data science findings.
- Students will be able to facilitate data-informed discussions through listening, questioning, and presenting.

Competency F: Value and safeguard the ethical use of data in all aspects of the profession.

- Students will be able to identify and analyze social, legal, and ethical issues in data science.
- Students will be able to interpret and apply a professional code of ethics relevant to the data science profession.
- Students will be able to interpret the activities and choices of others within an ethical framework and determine an appropriate action based on standards of professional conduct.

Competency G: Transform findings from data resources into actionable business strategies.

- Students will be able integrate data science capabilities into the formation of a situation analysis.
- Students will be able to explain how data assets can be used to develop competitive advantage.
- Students will be able to identify and appraise the leadership and management skills required to direct a team of data science professionals toward meeting organizational goals.

Assessment of Student Learning Outcomes

The assessment of student learning outcomes for the M.S. in Data Science degree program will be managed by an assessment team composed of the six academic program directors from each partner campus as well as the program manager. This team also serves as the oversight and decision-making

body for the program. The team will meet biannually in person; however, teleconferences may be used to meet more frequently if need arises.

The assessment team will identify and define measures and establish a rubric for evaluating how well students are meeting the program's seven competency areas. The team will also identify what data will be needed and serve as the collection point for the data. As a part of the course development process, the assessment team will determine which examples of student work will be most appropriate to demonstrate competency in a specific student learning outcome. Program graduates will be surveyed to determine success in securing employment related to the major, and regarding the types of roles and careers that graduates have entered.

The assessment team will receive data collected from campuses by UW-Extension each semester. UW-Extension will also monitor data on new enrollments, retention rates, and graduation rates. The assessment team will also compile these various sources of data and complete an annual report summarizing the data, the assessment of the data, and decisions regarding improvements to the curriculum, structure, and program delivery. The report will be shared with the faculty of the program and other stakeholders. Decisions of the assessment team will go through the normal curricular processes at each partner institution. The assessment team is responsible for ensuring that recommendations for improvement are implemented.

Student services, instructional, and business office personnel from each institution will also meet annually to review processes and concerns, and to make adjustments as necessary. Program evaluation regarding the collaborative nature of the model will help assess processes critical to the success of the collaboration, such as the financial model, student recruitment and advising, admission and enrollment processes and trends, and curriculum design.

Program assessment and evaluation occur on a more frequent schedule than in traditional academic programs. The M.S. in Data Science program will go through an informal program and fiscal review three years following degree implementation. Based on those discussions, recommendations will be made related to the continuation of the program. In addition, the program will engage in a five-year review as required by UW System. Designated Program Planning and Review Liaisons at each of the partner campuses will be invited to participate in these review processes.

Program Curriculum

The M.S. in Data Science program represents a fixed curriculum comprising 12 three-credit courses to include a capstone course (36 credit total). Graduates will leave the program as professionals with expertise in a number of specialized areas to include data mining and warehousing, predictive analytics, statistical modeling, database infrastructures and data management, machine learning, and analytics-

based decision making. A complete course listing with abbreviated descriptions is summarized as follows (see Attachment C for a listing of courses with detailed descriptions):

Course Number	Course Title	Course Description (abbreviated)	Host Campus
DS 700	Foundations of Data Science	Introduction to data science and its importance in business decision making	Green Bay
DS 705	Statistical Methods	Statistical methods and inference procedures presented with an emphasis on applications, computer implementation, and interpretation of results	La Crosse
DS 710	Programming for Data Science	Introduction to programming languages and packages used in data science	Eau Claire
DS 715	Data Warehousing	Introduction to the concepts and techniques to work with and reason about subject-oriented, integrated, time-variant, and nonvolatile collections of data in support of management's decision-making process	Stevens Point
DS 730	Big Data: High-Performance Computing	Overview of how to process large datasets efficiently to include introduction of non-relational databases	Oshkosh
DS 735	Communicating about Data	Prepares students to master technical, informational, and persuasive communication to meet organizational goals	Stevens Point
DS 740	Data Mining	Data mining methods and procedures for diagnostic and predictive analytics	Eau Claire
DS 745	Visualization and Unstructured Data Analysis	Covers various aspects of data analytics	Green Bay
DS 760	Ethics of Data Science	Ethical issues related to data science, including privacy, intellectual property, security, and the moral integrity of inferences based on data	Oshkosh
DS 775	Prescriptive Analytics	This course covers procedures and techniques for using data to inform the decision-making process.	La Crosse
DS 780	Data Science and Strategic Decision Making	The interaction between data science and strategic decision making. Leveraging data resources for competitive advantage in the marketplace	Superior

DS 785	Capstone	Capstone course in which students will develop and execute a project involving real-world data.	Superior

The curriculum planning workgroup has identified the following program prerequisites:

- Elementary Statistics
- Introduction to Programming
- Introduction to Databases

Internal course prerequisites have been defined on the attached detailed M.S. in Data Science Course Listing (Attachment C). Aptitude tests (GRE, GMAT, other) will not be required.

Institutional Program Array

There is consensus among the six academic partners that the M.S. in Data Science degree program will serve as a valuable complement to the existing graduate program array at each of their institutions and will not compete with any program currently offered.

Other Programs in the University of Wisconsin System

A comprehensive search of current graduate-level degrees or specializations in the areas of data science, predictive analytics, business analytics or related areas within the UW System yields no same or similar program to the M.S. in Data Science currently offered. It is clear that a gap exists within the state consistent with what our research suggested. There are a small number of graduate degrees within the System that demonstrate minimal overlap in courses and/or course topics. However, none of these offerings is provided in a fully online format targeting working adults. We are aware of a developing B.S. in Data Science currently under development at UW-River Falls and have had initial conversations with representatives of that institution regarding possible future collaborations.

The MS in Data Science curriculum planning workgroup did identify several similar regional graduate programs in the area of data science or related topics (only three of which were offered in an online format) that not only informed our planning but also assisted us in developing a unique online offering for professionals in this subject area. These programs include the following:

- DePaul University (IL), Master of Science in Predictive Analytics (online)
- Elmhurst College (IL), Master of Science in Data Science (online)
- Northwestern University (IL), Master of Science in Predictive Analytics (online)
- University of Minnesota, Master of Science in Business Analytics (face-to-face)
- University of St. Thomas (MN), Master of Science in Data Science (face-to-face)

Collaborative Nature of the Program

The M.S. in Data Science is a collaborative degree program that benefits from the shared resources of all partner institutions. UW System encourages and supports system-wide cooperative and collaborative efforts among institutions as one means to develop need-based programs of mutual interest, benefit, and value to all partners; add to the existing base of quality academic offerings within the System; and, more effectively and efficiently address the needs of both traditional and nontraditional learners, as well as employers within the state. This degree, like other collaborative programs currently offered within the System, provides each of the participating academic institutions the ability to offer a high-quality, sustainable program without a requirement to extend significant local resources or a risk of compromising existing programs.

Six partner campuses (UW-Eau Claire, UW-Green Bay, UW-La Crosse, UW-Stevens Point, and UW-Superior) collectively contributed in the development of the program curriculum and competencies. All 12 courses have been approved at each of the partner institutions. UW-Extension will provide administrative support, financial investment, marketing, and student services for the program. Although students choose a home institution where they receive the degree, all of the courses are developed and housed at UW-Extension. This cohesive development and offering of courses will ensure students have a consistent experience even though the faculty reside at the different partner institutions. All courses will be listed in the campus registration systems. All partners will share equally in the net revenues from the program.

In addition, the program will continue to engage external input and advice through a program Advisory Board consisting of 12 to 15 representatives from industry who will also serve as ambassadors and referral agents to the program. The academic directors from each of the six partner campuses will also hold seats on the board. The M.S. in Data Science Advisory Board will meet biannually. Program faculty will be invited to attend and participate in the meeting. The board members will also be asked to help host students working on capstone projects, and to help create school-to-work transitions so that as students graduate from the program, they will move to gainful employment. The program manager will provide assistance to the board, coordinate meetings, and so on. The academic directors of the program and program manager will engage with board members and ensure that the board is connected to the program in constructive and positive ways. Board meetings will provide opportunities to present program progress and successes, and to gather feedback regarding changes in the industry and how those changes may affect program graduates. The meetings will also help to ensure that the program stays relevant to trends in the field.

Finally, it is anticipated that the program will establish several unique partnerships with various companies that represent products and tools commonly used by data science professionals that may be

incorporated into the curriculum/courses. These connections will serve to better prepare and position students for success in the field upon graduation as they put their new knowledge to work.

Diversity

Consistent with current local efforts at all of the partner campuses, this program will strive to achieve inclusive excellence by enrolling, retaining, and graduating sufficient numbers of students from underrepresented populations; engaging faculty from underrepresented populations; implementing strategies to promote and support integration efforts; implementing multidimensional approaches to teaching and learning; and leveraging resources so that the program is able to respond to students' evolving and growing needs.

This degree will target primarily nontraditional student populations. Many students of color, first-generation Americans, first-generation college students, and low-income students are—often by necessity—nontraditional students because they have family or work responsibilities that prevent them from attending school in traditional formats. The online delivery format will also provide opportunities to those students who are time and place bound (do not reside within close proximity to an existing UW institution). Hence, from its inception, this degree is designed to attract underserved students. In addition, recruitment and marketing efforts for this degree will focus on underrepresented populations. UW-Extension will leverage advertising space on multiple partner sites in the "Diversity & Inclusion Network": BlackPlanet.com, AsianAvenue.com, MiGente.com, and others. UW-Extension will also advertise this program in minority-focused newspapers, periodicals, and websites.

While the proposed degree does not project a significant number of new faculty and staff, the partner campuses will continue to be committed to recruiting a culturally diverse campus community. The program will work toward achieving equity in the gender distribution of faculty, and faculty of color will be encouraged to participate in this program.

UW-Extension has several initiatives currently underway to attract more students of color into the UW System. Through UW HELP, brochures focusing on Hispanic and Hmong students are sent to those target groups. A program manager for the M.S. in Data Science program employed by UW-Extension will conduct outreach, working with employers to encourage and support the education of their employees, especially focusing on underrepresented minorities. In addition, the Advisory Board will provide support in this area by helping the program extend its reach to diverse prospective students and communities.

Ensuring that diverse student populations enter the M.S. in Data Science program is important, but equally important is providing the support services that students need to feel comfortable and able to succeed. The UW-Extension student adviser will work closely with all students to self-identify barriers to their success to either help them overcome those barriers directly or to point them to campus and other

resources that will be of assistance to them. UW-Extension will maintain online student environments that will allow individuals from diverse ethnic backgrounds to connect with other students over both cultural similarities and over programmatic interests to help build points of commonality and understanding. Social media opportunities for student connection will be made available through Facebook, Twitter, and LinkedIn, to name a few. Simply put, an essential goal of this program is to increase both the access for diverse audiences to this degree and the success of those students once they enter the program. To ensure that this goal is met, one of the areas of assessment focuses on diversity.

On the curricular side, faculty will incorporate topics and discussions related to diversity and inclusivity into courses as deemed valuable and appropriate to ensure students have an understanding of these issues and how they impact decisions. In addition, we recognize that adult students come to the learning environment from diverse backgrounds, with their bags packed full of unique knowledge and experiences, and looking for opportunities to share that knowledge with others. It follows then that the strength of this program and the success of our students is, in large part, based on our ability to attract and retain a diverse adult student audience.

Projected Time to Degree

Based on experience with similar collaborative offerings within the System and the typical adult student profile, it is assumed that most students will enroll part-time and take an average of three to four courses per year. At this rate, the majority of students would complete the program within 3 to 4 years. Students may enter the program for the spring, summer, or fall semester. Students will be encouraged to take courses in sequence and as influenced by internal course prerequisites. The capstone, which represents the culminating experience for students, must be taken the final semester.

Program Review Process

The collaborative partners, including all six academic institutions and UW-Extension, will review the program annually. Academic directors, faculty, and administrators from all partners will have input into programmatic changes and upcoming needs. UW-Extension, as the fiscal agent for this program, will manage resources to ensure that funds are available to invest in the program as needed. The decision about how to invest in the program will be made collaboratively by all partners. As defined in the partner agreement, the program will engage in an internal 3-year review focusing on both program and fiscal matters. In addition, the program will conduct a formal 5-year review as required by UW System.

Institutional Review

Each of the partner institutions provides a comprehensive review of academic programs as noted below.

UW-Eau Claire...Each department undergoes a thorough review within a maximum of seven years. At this time all programs in the department are reviewed. The Data Science program will be housed in the math department, and it will undergo review at that time.

UW-Green Bay…The Academic Affairs Council has responsibility and authority for review of all credit courses and all academic programs at both the undergraduate and graduate levels. Recommendations and decisions of the Academic Affairs Council are forwarded to the Faculty Senate.

UW-La Crosse…Academic programs undergo an Academic Program Review (APR) on a regular cycle as one component of the commitment to academic excellence. The Faculty Senate's Academic Program Review Committee coordinates the review process and provides an opportunity for program faculty to reflect on curriculum, assessment, new initiatives, personnel, and support for achieving the goals of the program. Programs that have external accreditation participate in UW-L's APR the year following their accreditation review. Programs without external accreditation participate in the process, which includes an external review, every seven years.

UW-Oshkosh…Academic program review will occur every seven years except for new programs which must undergo a joint System and institution review after five years. Program faculty and Deans should seek evaluation by external consultants as a supplement to the internal self-study. The following high level items are included in the program review: description of the program, staffing, resources needed such as library collections or computing services, an evaluation of the program and recommendations for the program going forward.

UW Stevens Point…The Department Review Subcommittee, which resides under the Faculty Senate's Academic Affairs Committee, reviews academic programs according to the Reporting Cycle for Assessment and Program Review. This occurs at 5 year intervals.

UW-Superior…The Academic Program Review Council is responsible for ongoing program review. The Academic Program Review Council will conduct and supervise a program audit and review process of the Data Science program on a regular basis and report the findings, stipulations, suggestions, and observations to the UW-Superior Faculty Senate. The Data Science program will also be reviewed annually as part of the Annual Assessment Plan of the Department of Business and Economics. The findings of the Annual Assessment Plan are reported annually in the Department of Business and Economics Annual Report.

Accreditation

While there are no specific professional credentialing agencies for the degree program, partners will be securing authorization to offer this collaborative, online master's degree from the Higher Learning Commission, the regional accrediting body for all six partner institutions. Each of the participating academic partners is currently under the Higher Learning Commission defined threshold for online program offerings.

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Attachments

Attachment A: Institutional Commitment Letter

Attachment B: M.S. in Data Science Budget Template

Attachment C: M.S. in Data Science Course Listing With Descriptions (Detailed)

Attachment A

Institutional Commitment Letter

Date: XXXXX, 2014

To: Stephen Kolison, Associate Vice President for Academic and Faculty Programs

From: David Schejbal, Dean

University of Wisconsin-Extension

Continuing Education, Outreach and E-Learning

Email: David.Schejbal@uwex.edu

On behalf of Patricia Kleine, UW-Eau Claire; Greg Davis, UW-Green Bay; Heidi Macpherson, UW-La Crosse; Lane Earns, UW-Oshkosh; Greg Summers, UW-Stevens Point; Faith Hensrud, UW-Superior; and John Shutske, UW-Extension; I request authorization to implement the Master of Science in Data Science.

This program will be a 36-credit collaborative, online, Master of Science degree in Data Science offered jointly by six UW institutions: UW-Eau Claire, UW-Green Bay, UW-La Crosse, UW-Oshkosh, UW-Stevens Point, and UW Superior. UW-Extension will provide administrative and financial support.

Students entering the program will select an administrative home institution from among the six degree offering partner campuses. Admission to the program will be through the student's administrative home institution.

Patricia Kleine, Provost and Vice Chancellor, UW-Eau Claire

Greg Davis, Associate Provost for Academic Affairs/Director of Graduate Studies, UW-Green Bay

Heidi Macpherson, Provost and Vice Chancellor, UW-La Crosse

Lane Earns, Provost and Vice Chancellor for Academic Affairs, UW-Oshkosh

Greg Summers, Provost and Vice Chancellor for Academic Affairs, UW-Stevens Point

Faith Hensrud, Provost and Vice Chancellor for Academic Affairs, UW-Superior

John Shutske, Interim Provost and Vice Chancellor, UW-Extension

Attachment B

M.S. in Data Science Budget Template

University of Wisconsin System

Cost and Revenue Projections For M.S. in Data Science Program

	Items	Projections				
		FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
		Year 1	Year 2	Year 3	Year 4	Year 5
I	Enrollment (New Student) Headcount	63	35	28	28	28
	Enrollment (Continuing Student) Headcount		63	98	126	154
	Enrollment (New Student) FTE	17	9	7	7	7
	Enrollment (Continuing Student) FTE	0	23	37	48	58
II	Total New Credit Hours (# new sections x credits per section)	30	57	63	63	63
	Existing Credit Hours	0	0	0	0	0
III	FTE of New Faculty/Instructional Staff					
	FTE of Current Fac/IAS	2.000	3.125	3.125	3.125	3.125
	FTE of New Admin Staff					
	FTE Current Admin Staff	6.000	6.000	5.250	5.250	5.250
V	New Revenues					
	From Tuition (new credit hours x FTE)	$287,100	$554,400	$757,350	$942,975	$1,128,600
	From Fees					
	Program Revenue - Grants					
	Program Revenue - Other					
	Reallocation					
	Total New Revenue	$287,100	$554,400	$757,350	$942,975	$1,128,600
VI	New Expenses					
	Salaries plus Fringes					
	Faculty/Instructional Staff	$160,800	$271,350	$267,920	$269,890	$271,860
	Other Staff	$542,423	$546,210	$480,756	$484,090	$487,422
	Other Expenses					
	Facilities					
	Equipment					
	Other:	$127,000	$131,500	$132,500	$132,500	$132,500
	Total Expenses	$830,223	$949,060	$881,176	$886,480	$891,782
VII	Net Revenue	-$543,123	-$394,660	-$123,826	$56,495	$236,818

Narrative: Explanation of the Numbers and Other Ongoing Commitments that will Benefit the Proposed Program

Program will be GPR funded until sufficient program revenues are available to begin to pay for the program expenses.

a - Number of students enrolled

b - To be based on 12 credits at the undergraduate level and 7 credits at the graduate level

c - Number of faculty/instructional staff providing significant teaching and advising for the program

d - Number of other staff providing significant services for the program

Attachment C

M.S. in Data Science Course Listing with Descriptions (Detailed)

Course Number	Course Title	Course Description	In-program Course Prerequisite	Campus
DS 700	Foundations of Data Science	This course provides an introduction to data science and highlights its importance in business decision making. It provides an overview of commonly used data science tools along with spreadsheets, relational databases, statistics, and programming assignments to lay the foundation for data science applications.	None	Green Bay
DS 705	Statistical Methods	Statistical methods and inference procedures will be presented in this course with an emphasis on applications, computer implementation, and interpretation of results. Topics include simple and multiple regression, model selection, correlation, moderation/interaction analysis, logistic regression, chi-square test, ANOVA, Kruskal-Wallis test, MANOVA, factor analysis, and canonical correlation analysis.	None	La Crosse
DS 710	Programming for Data Science	Introduction to programming languages and packages used in data science.	None	Eau Claire
DS 715	Data Warehousing	Introduces the concepts and techniques to work with and reason about subject-oriented, integrated, time-variant, and nonvolatile collections of data in support of management's decision-making process.	None	Stevens Point

DS 730	Big Data: High Performance Computing	This course will teach students how to process large datasets efficiently. Students will be introduced to non-relational databases. Students will learn algorithms that allow for the distributed processing of large data sets across clusters.	DS710	Oshkosh
DS 735	Communicating about Data	This course will prepare you to master technical, informational and persuasive communication to meet organizational goals. Technical communication topics include a study of the nature, structure and interpretation of data. Informational communication topics include data visualization and design of data for understanding and action. Persuasive communication topics include the study of written, verbal and nonverbal approaches to influencing decision makers.	None	Stevens Point
DS 740	Data Mining	Data mining methods and procedures for diagnostic and predictive analytics. Topics include association rules, clustering algorithms, tools for classification, and ensemble methods. Computer implementation and applications will be emphasized.	DS 705, 710	Eau Claire
DS 745	Visualization and Unstructured Data Analysis	This course covers two aspects of data analytics. First, it teaches techniques to generate visualizations appropriate to the audience type, task, and data. Second, it teaches methods and techniques for analyzing unstructured data – including text mining, web text mining and social network analysis.	DS 700 DS 705 DS 710 DS 740	Green Bay
DS 760	Ethics of Data Science	This course explores ethical issues related to data science, including privacy, intellectual property, security, and the moral integrity of	DS 700 or DS 780	Oshkosh

		inferences based on data.		
DS 775	Prescriptive Analytics	This course covers procedures and techniques for using data to inform the decision-making process. Topics include optimization, decision analysis, game theory, simulation, and others as time allows. Case studies and applications will be emphasized.	DS 705	La Crosse
DS 780	Data Science and Strategic Decision Making	The course will investigate the use of data science findings to develop solutions to competitive business challenges. Case studies will be reviewed to examine how data science methods can support business decision-making. A range of methods the data scientist can use to get people within the organization onboard with data science projects will be reviewed.	None	Superior
DS 785	Capstone	Capstone course in which students will develop and execute a project involving real-world data. Projects will include: formulation of a question to be answered by the data; collection, cleaning and processing of data; choosing and applying a suitable model and/or analytic method to the problem; and communicating the results to a non-technical audience.	DS700, DS705, DS710, DS715, DS730, DS735, DS740, DS745, DS775	Superior

Proposed Changes to the Charge of

Individualized Learning Committee Charge

The proposal is to remove the struck-through elements and add the bold-face elements to the current charge:

1. The Individualized Learning Committee shall be composed of ~~eight (8)~~ **seven (7)** appointed members. It will include five (5) faculty members with no more than two from a domain voting district. ~~and the chair of the Interdisciplinary Studies Committee.~~ The Personal Major Advisor and ~~Director of Assessment Services~~ **the Coordinator of Testing Services** serve as ex-officio, non-voting members. Each faculty member will serve a three (3) year staggered term to assure continuity.
2. Nomination of candidates for appointment to the Individualized Learning Committee is the responsibility of the Committee on Committees and Nominations. Appointments are made annually by the University Committee.
3. Individualized Learning Committee activities are coordinated by a chairperson elected by Committee members at the beginning of each academic year. The chair will be responsible for establishing a committee structure and making committee assignments.
4. The Individualized Learning Committee serves the following functions:
    a. Advises the Provost and Vice Chancellor for Academic Affairs or his/her designee on policies and procedures related to Credit for Prior Learning and Credit by Examination.
    b. Evaluates Personal Major proposals and determines whether to recommend approval.
5. The chair must submit a report of Committee activities at the end of each academic year to the Secretary of the Faculty and Academic Staff and the Chair of the University Committee.

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