technical communication, computational science). Data science is an interdisciplinary field and thus does overlap with mathematics and computer science. However, the UW-River Falls design is to take advantage of the overlap to offer to something that is a value-added synthesis of a number of strong academic offerings at the University.

There are no other degree programs in Data Science and Predictive Analytics in the University of Wisconsin System.

At the undergraduate level, Hanover Research was able to identify only five programs in data science across the United States:
- Arizona State University
- College of Charleston
- Northern Kentucky University
- The Ohio State University
- University of San Francisco

It appears that these programs were begun in 2011 or later.

Collaborative Nature of the Program

There are already discussions and offers to connect the undergraduate program with other UW-River Falls graduate programs as well as those offered by UW-Stout and UW Extension’s collaborative graduate program being developed in data science/data analytics.

Diversity

The faculty members involved in the program are committed to inclusivity and diversity and will work with undergraduate admissions to partner with schools that have a high potential for multicultural and disadvantaged students enrollments in the program. The recent and high profile efforts to collaborate with Native American communities will also inform the university’s outreach and engagement. The university has a retention specialist working specifically with diversity populations to assure improved retention and graduation rates.

Student Learning Outcomes

A graduate will understand the Big Data phenomenon and its drivers (e.g. Internet of Things), and recognize the challenges of capturing, storage and retrieval of massive data

A graduate will gain knowledge about the API ecosystems and data infrastructure that supports the acquisition, storage, retrieval and analysis of massive data

A graduate will understand the foundations, frameworks and applications of the emerging field of data science and gain skills in applying data-based analytical approach to identify and solve problems

Program Objective

To graduate students with a Bachelor of Science degree in Data Science and Predictive Analytics who possess the ability to develop, manage, and analyze data sets across a range of industry and non-profit sectors.
To prepare students to be successful in graduate programs where data science and data analytics are key components of the program.

Assessment of Objectives
Describe Assessments and Objectives

Program Curriculum

Total of 74-75 Credits

Program Core (Total of 60 Cr)

Computer Science and Information Systems (Total Credits 36)

Existing Courses: (21 Credit)

CSIS 161 - programming I (3 Cr)
CSIS 162 - Programming II (3 Cr)
CSIS 215 - Information System (3 Cr)
CSIS 225 – Web Development (3 Cr)
CSIS 235 - Object Oriented Programming (3 Cr)
CSIS 333 - Database Management Systems (3 Cr)
CSIS 237 - Data Structures (3 Cr)

New Courses: (15 Credits)

CSIS 239 - Introduction to Data Science (3 Cr)
CSIS 334 - Data Visualization (3 Cr)
CSIS 339 - Massive data Storage and Retrieval (3 Cr)
CSIS 452 - Applied Machine Learning (3 Cr)
CSIS 488 - Capstone Data Science Practicum Project (3 Cr)

Math (Total Credits 21)

Existing Courses: (21 Cr)

MATH 166 - Calculus I (4 Cr)
MATH 167 - Calculus II (4 Cr)
MATH 236 - Discrete Mathematics (4 Cr)
MATH 256 - Linear Algebra (3 Cr)
MATH 326 - Applied Statistics (3 Cr)
MATH 327 – Applied Regression Analysis (3 Cr)

Economics (Total Credits 3)

Existing Courses (3 Cr)
ECON 426 - Econometrics (3 Cr)

**Elective Options**

Computer Science: Double Major in CSIS

Math: Double Major in Math

Accounting (Existing Courses): (15 Cr – choose from following set of courses)

ACCT 231 - Principles of Accounting I (3 Cr)
ACCT 232 - Principles of Accounting II (3 Cr)
ACCT 321 - Intermediate Accounting I (3 Cr)
ACCT 322 - Intermediate Accounting II (3 Cr)
ACCT 356 - Cost Accounting (3 Cr)
ACCT 366 - Accounting Systems (3 Cr)

Finance (Existing Courses): (15 Cr – choose from following set of courses)

ACCT 231 - Principles of Accounting I (3 Cr)
ACCT 232 - Principles of Accounting II (3 Cr)
FINC 345 - Managerial Finance (3 Cr)
FINC 348 - Investment (3 Cr)
FINC 360 - Financial Derivatives
FINC 448 - Portfolio Management (3 Cr)

Management(Existing Courses): (15 Cr – choose from following set of courses)

MNGT 300 - Management and Organizational Behavior (3 Cr)
MNGT 361 - Operations Management (3 Cr)
MNGT 318 - Operations Research (3 Cr)
MNGT 340 - Ethical Leadership (3 cr)
MNGT 350 - Decision Making (3 cr)
MNGT 365 - Business Process Management (3 cr)

Marketing(Existing Courses): (15 Cr)

MKTG 311 - or MKTG 310 - Principles of Marketing (3 Cr)
MKTG 334 - Internet and Direct Marketing (3 Cr)
MKTG 365 - Marketing Research (3 Cr)
MKTG 325 - Relationship Selling (3 Cr)
MKTG 327 - Sales Analytics (3 Cr)

Economics(Existing Courses): (12 Cr)

Econ 201 - Principles of Microeconomics (3 Cr)
Econ 202 - Principles of Macroeconomics (3 Cr)
ECON 301 - Intermediate Microeconomics (3 Cr)
ECON 302 - Intermediate Macroeconomics (3 Cr)

Geographic Information Science (Existing Courses): (15 Cr – No new courses)

Required Courses (9 Cr)

- Geography 250 Introduction to Geographic Information Science (3 Cr)
- Geography 360 Geographic Information Systems: Theory and Methods (3 Cr)
- Geography 460 Geographic Information Systems: Analysis and Modeling (3 Cr)

Electives Courses (Choose 6 Cr)

- Geography 351 Map Design (3 Cr)
- Geography 365 Quantitative Techniques (3 Cr)
- Geography 366 Field Methods and GPS (3 Cr)
- Geography 368 Digital Image Processing (3 Cr)
- Geography 455 Advanced Map Design (3 Cr)

Projected Time to Degree

The projected time to degree for full-time students is four years and students should be able to complete all university and program requirements at or slightly above the 120-credit target. Transfer students may vary significantly but should complete the program in two to three years after transferring to UW-River Falls. The university will seek articulation agreements as warranted to facilitate student recruitment and timely graduation.

Program Review Process

The program will be reviewed every six years, and annual performance data, including enrollment, revenue, and costs, will be uploaded into the university’s program prioritization process and system.

Institutional Review

UW-River Falls employs a rigorous approach to course and program proposals. Substantive course changes and new course proposals emanate from departments and go through appropriate college curriculum committee review before being evaluated by university level general education and/or undergraduate curriculum committees. New programs are reviewed at the collegiate level before going to the curriculum committee and then the academic program and planning committee. The Faculty Senate then reviews and votes on all program proposals before being approved by the Provost and Chancellor.

The UW-River Falls’ academic deans and the Chancellor’s cabinet reviewed the specific proposal for Data Science and Predictive Analytics at the entitlement stage.

Accreditation

At present there are no plans to seek accreditation, though as the discipline emerges there may be an opportunity to seek ABET accreditation.