



NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): Maryville University of St. Louis

Program Title: Data Science

Degree/Certificate: Master of Science

Options: None

Delivery Site(s): Main Campus

CIP Classification: 11.0802

\*CIP code can be cross-referenced with programs offered in your region on MDHE's program inventory [higher.mo.gov/ProgramInventory/search.jsp](http://higher.mo.gov/ProgramInventory/search.jsp)

Implementation Date: August, 2017

Cooperative Partners: None

\*If this is a collaborative program, form CL must be included with this proposal

AUTHORIZATION:

Mary Ellen Finch, VP Academic Affairs

Name/Title of Institutional Officer

*Mary Ellen Finch* 3/31/17  
Signature Date

Cherie Fister, Dean, College of Arts and Sciences

Person to Contact for More Information

314-529-9638

Telephone



## STUDENT ENROLLMENT PROJECTIONS

---

Year	1	2	3	4	5
Full Time	4	6	8	8	8
Part Time	4	6	8	12	17
Total	8	12	16	20	25

Please provide a rationale regarding how student enrollment projections were calculated:

The enrollment projections are conservatively based on typical program starts at Maryville and the enrollment in a similar program at Maryville University, Actuarial Science. Many students majoring in actuarial science and mathematics at Maryville have showed strong interest in pursuing MS in data science. More than sixty international students have inquired information for admission to MS in data science program since June 2016.

Provide a **rationale** for proposing this program, including **evidence of market demand and societal need supported by research**:

As part of the new program approval process, Maryville gathered market information that shows graduate programming degrees are on the rise at both the national and local levels. Maryville also gathered information from the Bureau of Labor and Statistics that showed the field is projected to grow 10.5% within the next decade. Data science is a growing industry due to technological advances and the collection of data sets in different industries. According to the 2012 Harvard Business Review, data science is listed at “the sexiest job of the 21st Century.” Maryville’s MS program in Data Science will prepare individuals for open data science positions at the local, regional, and national level. The daily average job openings in data science is 1000 in the past year in the metro St. Louis area according indeed.com. The average Data Scientist salary is \$113,436 according to glassdoor.com.

[www.dhe.mo.gov](http://www.dhe.mo.gov) • [info@dhe.mo.gov](mailto:info@dhe.mo.gov)

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635

Form SE - Student Enrollment Projections



PROGRAM STRUCTURE

A. Total credits required for graduation: 36

B. Residency requirements, if any: 30

C. General education: Total credits: 0

D. Major requirements: Total credits: 36

Course Number	Credits	Course Title
<b>Core Courses (6 courses required)</b>		
Math 502	3	R Programming
Math 503	3	Python Programming
Math 504	3	SQL Database Programming
Math 505	3	Regression and Time Series
Math 506	3	Statistical Modeling
Math 508	3	Machine Learning
Math 510	3	Risk Theory
Math 512	3	Predictive Modeling
Math 572	3	Mathematical Statistics III
<b>Elective Courses (5 courses required)</b>		
Math 501	3	Mathematical Modeling with Tech
Math 514	3	Theory of Interest
Math 515	3	Financial Mathematics I
Math 516	3	Financial Mathematics II
Math 521	3	Actuarial Modeling I
Math 522	3	Actuarial Modeling II
Math 607	3	Simulation and Credibility
Math 610	3	Enterprise Risk Management
Math 611	3	Derivative Markets
Math 612	3	Experimental Design
Math 613	3	NoSQL Database
Math 614	3	Data Mining
Math 599	6	Internship
Math 699	3	Internship
<b>Capstone Project</b>		
Math 597	3	Capstone

E. Free elective credits: 0 credit hours

(Sum of C, D, and E should equal A.)

[www.dhe.mo.gov](http://www.dhe.mo.gov) • [info@dhe.mo.gov](mailto:info@dhe.mo.gov)

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635

F. Requirements for thesis, internship or other capstone experience:

Students are required to collect and process data, design the programs to solve the problem, implement solutions, and present their findings in a customized eBook.

G. Any unique features such as interdepartmental cooperation:

Not applicable



## PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

---

Institution Name      Maryville University of St. Louis  
Program Name          MS in Data Science  
Date      3/28/2017

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

### 1. Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.  
A bachelor's degree in mathematics or other related field from a regionally accredited college or university is required, a minimum GPA (Grade Point Average) of 3.0 (on 4.0 scales) in the last two years of the baccalaureate degree. International students must demonstrate English proficiency with a TOEFL IBT 79 score, IELTS score of 6.0, an undergraduate degree in the United States, an Undergraduate degree where medium of instruction is English, or by submitting a writing sample.
- Characteristics of a specific population to be served, if applicable.  
No special characteristics.

### 2. Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.  
Ph.D. degree in data science, mathematics, statistics, computer science, or a related field is preferred. Minimum of a Master degree or equivalence in data analytics, or a related field. Prior teaching experience and relevant data analytic experience are required. The College of Arts and Sciences at Maryville has strong expertise in the area of actuarial science, data science, and statistics.
- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.  
It is estimated that 60% of the credit hours will be instructed by full time faculty. This percentage will be revised based on student enrollment and the needs of the university.

[www.dhe.mo.gov](http://www.dhe.mo.gov) • [info@dhe.mo.gov](mailto:info@dhe.mo.gov)

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635



- Expectations for professional activities, special student contact, teaching/learning innovation.  
Faculty are expected to stay current on data science industry trends and innovations to ensure content is aligned with emerging concepts that will enhance student knowledge and practice within the field.

### 3. Enrollment Projections

- Student FTE majoring in program by the end of five years.  
16
- Percent of full time and part time enrollment by the end of five years.  
32% full time and 68% part time enrollment by the end of five year.

### 4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.  
6 graduates three years after implementation. 10 graduates five years after implementation.
- Special skills specific to the program.  
Data analytics, statistical analysis, programming and communication.
- Proportion of students who will achieve licensing, certification, or registration.  
Not applicable.
- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.  
Not applicable.
- Placement rates in related fields, in other fields, unemployed.  
No data is currently available since the program has not begun; although Bureau of Labor statistic reviewed prior to program development indicate that available positions in the field will grow 10.5% within the next ten years. This, coupled with our high success rate in job placement for students within the program of actuarial science, gives strength to future placement rates for these students.
- Transfer rates, continuous study.

[www.dhe.mo.gov](http://www.dhe.mo.gov) • [info@dhe.mo.gov](mailto:info@dhe.mo.gov)

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635

Students will be able to transfer up to 6 graduate credits into the program although transfers are expected to be minimal.

#### **5. Program Accreditation**

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. **If there are no plans to seek specialized accreditation, please provide a rationale.**

All Maryville programs are regionally accredited by the Higher Learning Commission.

#### **6. Alumni and Employer Survey**

- Expected satisfaction rates for alumni, *including timing and method of surveys*. Alumni will be surveyed annually after graduation through Maryville Career Success and Professional Development Office. It is expected that 90% of students will express satisfaction with the program and program outcomes.
- Expected satisfaction rates for employers, including timing and method of surveys. Employers will be surveyed annually, and it is expected that 90% of the employers will be satisfied with the program and skill levels of our graduates.

#### **7. Institutional Characteristics**

- Characteristics demonstrating why your institution is particularly well-equipped to support the program.

Maryville employs full time faculty with area expertise and has created numerous corporate partnerships, of which many will yield knowledgeable, skilled adjunct faculty for the program, all in an effort to expose our students to a variety of perspectives on topics within this program. Additionally, Maryville has sought to build a technological infrastructure that will meet or exceed the requirements necessary to support this program.