



3. Provide a justification for the specialization, including the potential benefits to students and potential workforce demand for those who graduate with the credential.¹

The benefits of the specializations for students are more structured, rigorous and consistent curricula and better marketability of their degree: the current name of the degree is not specific

-understood terms that reflects the specific education that the students will

degree programs offered by the department. The increased clarity of this alignment will improve

The expected demand for people trained in all three proposed specializations is currently extremely high in the region and the nation. The demand is not likely to reduce in the future. The employment in these areas.

Evidence of the substantial, wide-spread demand in the mathematical sciences (those being mathematics, statistics, and data science) is abundant.

- < The first major report to this effect came from McKinsey in 2011 when it published its study *Big data: The next frontier for innovation, competition, and productivity* which predicted that by 2018 “140,000-190,000 more deep analytical talent positions, and 1.5 million more data-²
- < Since then, a steady flow of reports and articles from the likes of the Harvard Business Review, Forbes, Glassdoor, CareerCast, and InfoWorld continued to confirm the exceptional demand for skilled mathematical scientists and the high quality of jobs in this area. For example, Glassdoor rated Data Scientist the best job in the nation in 2016, 2017, 2018, and 2019³ based on the number of job openings, the job satisfaction rating, and the median

career paths open to graduates of the proposed specializations in the top ten, They are (with rankings) Mathematics (2), University Professor (3), Statistician (5), Data Scientist (7), Operations Research (9), and Actuary (10).

- < LinkedIn named its top 20 emerging jobs of 2017, with four distinct data science jobs in the top ten. Specifically, they are (with rankings) Machine Learning Engineer (1), Data Scientist (2), Big Data Developer (5), and Director of Data Science (8).⁸
- < In January 2019, ⁹ included only four non-health-care professions in the top 20. Two of those were Statistician (2) and Mathematician (17).

At the state and regional level, demand in this area is already strong and is predicted to grow. For ¹⁰ puts

employment growth from 2014 through 2024, with growth projected at 13.2%.

Similarly, *Growth and Change in South Dakota Labor Markets*¹¹ states that with respect to new jobs created between 2001 and 2013,

Especially rapid growth occurred in the health professions, computer/mathematical and

noting that,

engineering and math-

It goes on to state that when looking to the future,

stry is a major employer of a large variety of workers in various business and management professions as well as scientific, engineering and computer science and mathematical technology occupations. Strong job growth and very low unemployment rates in this industry and among the major professional occupations that make up this industry also suggest growing

and finally that,

technical) industry, a strong long-term record of job growth with only modest cyclical swings in employment and very bright national outlook, we believe that the prospects for growth in this industry are quite bright in South Dakota. The basic constraint on this growth will be access to qual

The proposed specializations will provide direct responses to this ongoing, extraordinary demand for mathematical sciences expertise in the workforce.

⁸ <https://economicgraph.linkedin.com/research/LinkedIns>

4. List the proposed curriculum for the specialization (including the requirements for completing the major – *highlight courses in the specialization*):

