

**Request for Authorization to Establish  
Master of Applied Data Science  
CIP 30.7001  
University of North Carolina at Chapel Hill**

**I. Program Highlights**

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- The University of North Carolina at Chapel Hill (UNC-Chapel Hill) proposes the establishment of an online Master of Applied Data Science.
- The institution proposes an innovative, broadly applicable, team-based, 30-credit Master of Applied Data Science online program providing advanced training in data science that enables success in today's data-driven world.
- The proposed degree aligns with the mission of UNC-Chapel Hill to serve as a hub for research, scholarship, and creativity and to teach a diverse community of undergraduate, graduate, and professional students to become the next generation of leaders.
- The program addresses the critical need for advanced training in data science. The program speaks directly to a growing and higher-than-average demand for data science roles in public, private, and non-profit organizations in the state and the nation. Beyond employer demand, data literacy is essential for competitiveness and competency in both the workplace and to develop an informed citizenry amid an explosion in data sources and data-driven technologies.
- Graduates from this program will gain general programming, statistical and mathematical thinking, data management, and data governance and ethics skills, as well as specialized skills in machine learning, deep learning, and visualization/communication. Graduates coming from data-related backgrounds can advance their data science careers and progress into specialist roles or leadership roles in those sectors. Graduates coming from non-data-related backgrounds will gain new data skills and a new degree that will allow them to switch to a high-demand data science career in industry, government, or non-profits.

**II. Academic Program Planning Criteria (UNC Policy 400.1)**

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**1. Relation to Campus Distinctiveness and Mission.**

Two main elements from this program can be highlighted: alignment with the University of North Carolina System and UNC-Chapel Hill strategic plans and collaborative design and delivery. First, the proposed degree aligns with the UNC System 2017-2022 Strategic Plan: Higher Expectations vision to help all North Carolinians reach their full potential. Specifically, the program will support two of five core goals of the UNC System strategic plan - access and economic impact. By delivering online, the proposed program will be accessible in all 100 counties of North Carolina. Moreover, the proposed degree aligns with the mission of UNC-Chapel Hill to serve as a hub for research, scholarship, and creativity. Particularly, it aligns with UNC-Chapel Hill strategic plan, Carolina Next - Innovations for the Public Good, by advancing key strategic initiatives and objectives. The program supports Strategic Initiative Two by facilitating experiential and collaborative learning that encourages the ethical use of data; Strategic Initiative Four by fostering creative collaboration in research and scholarship; and Strategic Initiative Six by developing partnerships with businesses, non-profits, and government to translate research-based ideas into practical applications for the public good.

Second, this program will be the first educational offering of the new UNC-Chapel Hill School of Data Science and Society (SDSS) and will express its collaborative spirit. The curriculum was co-designed with key academic units at UNC-Chapel Hill, including the School of Information and Library Science, the Department of Biostatistics at the Gillings School of Global Public Health, and the Departments of

Computer Science, Mathematics, and Statistics and Operations Research in the College of Arts and Sciences.

## **2. Student Demand.**

Rising prospective student interest in Data Science programs is mirrored by employer demand. According to Burning Glass Technologies (2017), the demand for Data Science jobs was forecasted to grow by 15 percent by 2020. A search of online job postings for Data Science jobs found an average of 35,175 postings a month for the 12 months ending March 2021. The median annual salary for Data Scientists is \$114,368. These robust demands remain to date and are only increasing with time as more and more industries recognize the need to use data and data science tools to compete in the marketplace. In line with strong employer demand, student demand and interest in data science degrees is expected to grow, given the rise in bachelor's level graduates from related fields (computer science, mathematics, statistics, economics, etc.) who want to further their data science training or graduates from non-data-related backgrounds looking to complement their education with data science skills, given the prospect of high-paying and highly relevant jobs in this field (Malas, Fortune Higher Education, 2022).

Finally, it is worth noting that the world is witnessing an undeniable explosion in data and data-driven technologies, such as social media and Artificial Intelligence (AI), influencing every field of science and every aspect of people's lives. Data literacy is essential for competitiveness and competency in both the workplace and to develop an informed citizenry, which will only further student demand for data science degrees.

## **3. Employment Opportunities for Graduates.**

The careers available for Data Science graduates have job outcomes and projected growth well above the national average, suggesting a strong return on investment. These jobs also require a combination of skills distinct from those achieved in shorter boot camp programs. Top career outcomes include the following positions, listed with current median salaries and expected growth over the next ten years (Source – Lightcast): Data Scientist - \$114,368, 19 percent growth; Database Administrator - \$88,484, 11.5 percent growth; Data Analyst - \$74,744, 9.3 percent growth.

## **4. Impact on Access and Affordability.**

The proposed program is expected to result in lower levels of student debt than other master's degrees, as per data from the National Postsecondary Student Aid Survey (NPSAS) and the National Center for Education Statistics (NCES) analysis on comparable Master of Science programs. The proposed online program is expected to have no additional housing or travel expenses and a lower in-state tuition cost (\$1,141.78 per credit) than comparable programs at peer programs (e.g., Duke (\$3,478 per credit – on-campus), Johns Hopkins (\$1,696 per credit - online), George Washington (\$2,075 per credit – on-campus), and University of California Berkeley (\$2,780 per credit – online). Additionally, program graduates are expected to benefit from higher employment rates and strong job growth in data science-related fields. Graduates from the proposed degree are projected to incur a \$34,253 (in-state) to \$64,740 (out-of-state) maximum debt principal amount for completing the degree program. Conservative earnings estimates provided above could realistically see graduates pay off this debt within their first decade post-graduation.

For year one, UNC-Chapel Hill plans to use the 2023-2024 University of North Carolina Board of Governors approved UNC-Chapel Hill MS in Statistics, Analytics, and Data Science tuition rates. SDSS will submit a proposal to request a program-specific tuition rate during the next tuition and fees request cycle. The requested tuition and fees for the 2023-2024 academic year full-time (9+ credit hour) rates are as follows:

**Full-Time Estimated 2023-2024 Master's Tuition and Fees per Year (In Dollars)**

Category	Resident	Non-Resident
Tuition	10,552.00	28,844.00
Tuition Differential	10,000.00	10,000.00
Mandatory Fees (Athletics, Student Activities, Health Services, Educational & Technology, Campus Security, Debt Service, ASG)	516.00	516.00
Special Fees	--	--

**5. Expected Quality.**

The proposed program will combine advanced data science methods with real-world applications to build bridges across academic and professional spaces. Drawing on decades of cross-campus faculty expertise and industry connections, the program will empower students to leverage each stage of the data life cycle, not only to apply meaningful insights at work but also to help solve today's grand challenges in North Carolina and around the world. The course design and delivery will be a collaboration with faculty members from key academic units at UNC-Chapel Hill, such as the School of Information and Library Science, the Department of Biostatistics at the Gillings School of Global Public Health, and the Departments of Computer Science, Mathematics, and Statistics and Operations Research in the College of Arts and Sciences. The program will be distinguished by its focus not only on data science methods but also training students on data science applications and data ethics. The program will equip students with practical tools to solve real-world problems with ethical principles in mind. Importantly, the program will conclude with a team-based capstone in which students will work on real-world data challenges with two mentors – one academic and one from industry/non-profit/government sectors.

**6. Faculty Quality and Number.**

Current faculty members at UNC-Chapel Hill (lead faculty) from academic units such as Information and Library Sciences, Biostatistics, Computer Science, Statistics and Operations Research, and Mathematics will design courses, create asynchronous material, and develop lesson plans for the synchronous portion of the courses. The program plans to appoint the first group of ten lead faculty during the first year of the program to develop a baseline curriculum. These faculty members will join as secondary appointments from partnering academic units on campus.

The program leverages a co-teaching model where lead faculty develop all presentations, course materials, readings, assignments, and rubrics, and experienced professionals (section instructors) teach weekly online synchronous sessions in small groups. The program expects to hire a section instructor for every 20 students enrolled in a course. Instruction will be augmented from SDSS tenure-track faculty hires in the coming years.

**7. Relevant Lower-level and Cognate Programs.**

All courses will be developed by current faculty from the academic units on campus, building on current educational offerings where possible, adapting them to relevant, highly demanded, applied data science skills and tools, and adjusting them to state-of-the-art online education delivery methods.

**8. Availability of Campus Resources (library, space, etc.)**

Since this is a fully online, remote program, renovation of existing square footage will not be needed. All students will be remote. The professors who develop the courses will be able to use their existing office space, as will existing staff.

**9. Existing Programs (Number, Location, Mode of Delivery).**

Other degree programs in the UNC System offer training in data analytics or data science. Three have an online component or offering. As described above and in the proposal, the prevalence of data analytics training and workforce development needs continues to grow. Discussions with other programs clarified that the market analysis for high student demand is consistent with their experiences with student demand and job placement.

**10. Potential for Unnecessary Duplication.**

This proposed program does not involve unnecessary duplication and will complement, give visibility, and catalyze current data science efforts in the state and on UNC-Chapel Hill's campus. Many of the programs in other UNC System universities are analytics programs, whereas the proposed program is a broader data science program. The analytics program at NC State University and the business analytics program at University of North Carolina at Charlotte are both PSM (Professional Science Masters) programs that have specific requirements or courses. While the proposed program targets working professionals, it is not a PSM program. Additionally, the proposed program is 100 percent online and aimed at working professionals. Online synchronous meetings of the courses will occur in the evenings or on weekends in some cases. The program will be offered with 50 percent of student time spent in asynchronous learning and 50 percent contact time synchronously for each course. Specifically, the program is distinguished by its additional focus not only on data science methods but also training students on data science applications and ethics.

**11. Feasibility of Collaborative Program.**

UNC-Chapel Hill continues to look at the proposed program as being complimentary to other programs rather than competitive. SDSS leadership currently has regular interactions with other data science faculty and leadership in other UNC System institutions. Once the program is up and running, program leadership will continue to seek specific collaborative opportunities with other programs. Opportunities include sharing best practices and trends, shared in-person experiences, and being ambassadors of the data science academic ecosystem to state and local governments and industry.

**III. Summary of Review Processes**

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**1. Campus Review Process and Feedback.**

The proposal was reviewed by SDSS leadership; Chairs of the Computer Science, Biostatistics, Mathematics, and Statistics and Operations Research; Administrative Board of the College of Arts and Sciences; Administrative Board of The Graduate School; Chief Financial Officer; Provost; and Chancellor. Approval and support were provided at all levels.

- 2. UNC System Office Review Process and Feedback.** Throughout the review process, UNC-Chapel Hill provided relevant information pertaining to program requirements and resources. The institution submitted appropriate documentation and research to support the statements made.

**IV. Recommendation**

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Staff recommends that the Board of Governors approve the University of North Carolina at Chapel Hill's request to establish the Master of Applied Data Science, effective spring 2024.