



Alabama Commission on Higher Education

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Proposal for a New Degree Program

I. Information and Rationale

A. Primary Contact Information

Institution: University of Alabama at Birmingham

Contact: Dr. Yuliang Zheng / Dr. Milena Stanislavova

Title: Professor and Chair of Computer Science / Professor and Chair of Mathematics Email:

yzheng@uab.edu / mstanisl@uab.edu

Telephone: (704) 806-8635 / (205) 934-2154

B. Program Information

Date of Proposal Submission: 09/12/25

Award Level: Bachelor's Degree

Award Nomenclature (e.g., BS, MBA): BS

Field of Study/Program Title: Data Science

CIP Code (6-digit): 30.7001 (Data Science, General)

C. Administration of the Program

Name of Dean and College: Dr. Kecia Thomas, College of Arts and Sciences

Name of Department/Division: Computer Science and Mathematics

Name of Chairperson: Dr. Yuliang Zheng and Dr. Milena Stanislavova

D. Implementation Information

Proposed Program Implementation Date: 8/18/2025

Anticipated Date of Approval from Institutional Governing Board: 09/12/25

Anticipated Date of ACHE Meeting to Vote on Proposal: 12/12/25

SACSCOC Sub Change Requirement (Notification, Approval, or NA):

Other Considerations for Timing and Approval (e.g., upcoming SACSCOC review):

E. Concise Program Description

Include general opportunities for work-based and/or experiential learning, if applicable.

Our modern world is inundated with data and jobs that require data analysis skills. With so much data, there is more demand for people who can understand and interpret data in a meaningful way. Undergraduate degrees in data science are now a prevalent undergraduate program in many universities and colleges in the US. This rise in the number of degree programs in data science is driven by the growth in the demand for occupations



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in further advancing artificial intelligence (AI). This trend is present in Alabama (see Table 1).

Table 1: Searching results of positions containing keyword “data science” on LinkedIn.com (April 12, 2024)

Area	Number of positions
Alabama	6,633
Greater Birmingham area*	6,065

*Some jobs are remote or available in other cities, which is why there is not much discrepancy between the city and the state.

Projected job openings increase in future years based on predictions by the US Bureau of Labor and Statistics.

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Local	6,065	6,277	6,497	6,724	6,960	32,523
State	6,633	6,865	7,105	7,354	7,612	35,569
SREB	31,455	32,556	33,696	34,875	36,096	168,678
Nation	112,005	115,925	119,983	124,182	128,528	600,623

To address the high demand in job opportunities in data driven fields, the Department of Computer Science (CS) and the Department of Mathematics (Math) at the College of Arts and Sciences (CAS) in the University of Alabama at Birmingham (UAB) propose to establish a joint undergraduate program in Data Science. With the recent explosion of Artificial Intelligence (AI), it is important that our graduates understand how (1) to cultivate the data to feed into the AI models, (2) to analyze, compare and select the best AI and other data analytical tools for intended applications, (3) to present analytical results in an effective manner, and (4) to suggest optimal actions based on the outcomes of data analysis. Additionally, this new undergraduate program is built on the success of the MS program in Data Science established by the Department of CS in 2018. The MS program has flourished within the past four years, enrolling 152 students in Fall 2023, contributing to the production of the data science workforce to meet the large demand projected by the Bureau of Labor Statistics. The growth of the MS program coupled with the number of Math/CS graduates over the past five years who would have been candidates for the BS Data Science (76) illustrates the demand for the proposed program.

Currently, students wanting to pursue data science, complete both the BS in Mathematics and the BS in Computer Science at UAB. The dual BS degrees are necessary due to the heavy intertwining of mathematics and computer science skills required by data science. Computer science students generally require more mathematics, and mathematics students require more computer science. The new multidisciplinary degree combines the necessary courses from both computer science and mathematics into one BS degree, which will be open to all undergraduate students. The fully integrated and complementary course design will enable a rigorous and comprehensive curriculum for a BS degree in Data Science. The curriculum has been carefully designed to ensure a strong foundational understanding of the theoretical and computational methodologies in mathematics and computer science. Additionally, a breadth of well-balanced courses in data analysis with domain emphasis is offered to solidify how the mathematics and computer science courses



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apply to the field of Data Science. Upon completing the BS in Data Science, students will have the opportunity to further their education with the MS in Data Science program.

F. Specific Rationale (Strengths) for the Program

List 3 – 5 strengths of the proposed program as specific rationale for recommending approval of this proposal.

1. The program is a joint proposal between the Departments of Mathematics and Computer Science. Strategically intertwining these two disciplines empowers students to build competencies from the foundational theories behind data science techniques. Learning new techniques in data science requires a strong understanding of the foundational theories, and our graduates will be well prepared.
2. The proposed program includes a senior capstone course requiring students to develop a data science project with real-world applications. Most projects in this course will come from local industry or non-profit partners, forcing students to put the theoretical framework they learned into practice.
3. Data Science is an in-demand degree for which demand will only increase as the applications of AI continue to expand. As AI models continue to be improved, the data being used to train those models will become even more important. Graduates of this program will understand not only the techniques to collect, clean, and analyze data, but they will also learn the ethics surrounding data collection and analysis.
4. The curriculum in the proposed program will expose students to cutting edge technologies used in data mining and analysis along with the critical thinking skills to choose the best tools for solving a given problem.
5. An increase in data requires the need for increased security. Graduates of the proposed program will have a strong understanding of the security and privacy issues involved in data collection and storage as well as the ethics of using that data.

List external entities (more may be added) that may have supplied letters of support attesting to the program's strengths and attach letters with the proposal at the end of this document.

1. J. Mac Delay, Data Scientist, Telligent, Inc.
2. Roger Wang, Senior Data Scientist, AXS
3. Ronit Ron, Chair of the Board + Mentoring Program Co-Chair, Birmingham Women in Technology



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II. Background with Context

A. Student Learning Outcomes

List four (4) to seven (7) of the student learning outcomes of the program.

Upon completion of the program, students will be able to

1. communicate the results of data analysis to a variety of audiences,
2. collect, store, and model the data needed to answer questions and produce value,
3. formulate solutions to real-world problems using mathematical and computational strategies,
4. critique existing data models and develop a design to improve them, and
5. solve problems by integrating techniques in the field of data science such as machine learning, information visualization, artificial intelligence, and data engineering.

B. Similar Programs at Other Alabama Public Institutions

List programs at other Alabama public institutions of the same degree level and the same (or similar) CIP codes. If no similar programs exist within Alabama, list similar programs offered within the 16 SREB states. If the proposed program duplicates, closely resembles, or is similar to any other offerings in the state, provide justification for any potential duplication.

CIP Code	Degree Title	Institution with Similar Program	Justification for Duplication
52.1301	BS.Data Analytics	University of Montevallo	Similar program; however, the program we are proposing requires significantly more Math courses.
307001	BS Data Science	University of Alabama	Offered by the Math department with far fewer CS courses than the proposed degree.
11.0101	BS Computer Science/ Data Science Concentration	University of Alabama at Huntsville	This program is a CS degree with a concentration in Data Science, which does not include as much Math nor specialized courses in data science.

The proposed program differs from the existing programs in the state of Alabama due to the inclusion of an equal number of Math and CS courses, which delve deeper into the theories behind the Math and CS used in data science. It is the Math courses that truly differentiates the proposed program from the programs offered by the University of Montevallo and the University of Alabama at Huntsville. The opposite is the case for the University of Alabama, whose program is Math intensive where UAB's proposed program requires more CS. Moreover, a strength of the CS department at UAB is cybersecurity. The importance of data security and the ethics of collecting, storing, and analyzing data will be intertwined throughout the program.

The fast development of data collection methods in all areas of sciences in recent years has modified the demands on applied mathematics. Some datasets are so vast that they can be seen as continua of data. Modern applied mathematicians engage in direct collaboration with the sciences, and science requires that their data are included in the modeling from the very beginning. Science expects us to provide an explanation of the available data and possibly make testable predictions. The traditional theoretical approaches are still possible, but applied mathematics has expanded to include inference, statistical learning, data analysis, and AI as applied math tools.



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An applied mathematician in the 21st century needs to gain skills in

- development of new mathematical models (modeling),
- theoretical analysis of mathematical models,
- numerical solutions of these models, and
- data inferences and statistical learning.

Graduates of the proposed program will have the skills of a 21st century applied mathematician and computer scientist, which will enable the graduates to use these skills in a variety of industries using a variety of tools.

C. Relationship to Existing Programs within the Institution

1. Is the proposed program associated with any existing offerings within the institution, including options within current degree programs? Yes ☐ No ☒

(Note: Most new programs have some relationship to existing offerings, e.g., through shared courses or resources). If yes, complete the following table. If this is a graduate program, list any existing undergraduate programs which are directly or indirectly related. If this is a doctoral program, also list related master's programs.

Related Degree Program Level	Related Degree Program Title	Explanation of the Relationship Between the Programs
Bachelor's	Mathematics	Roughly half of the required courses will be courses offered by the Department of Mathematics
Bachelor's	Computer Science	Roughly half of the required courses will be courses offered by the Department of Computer Science

We hope to attract new students rather than lose Math and CS majors to the BS in Data Science; however, our majors are interested in pursuing data science as recent data demonstrates. Over the past five years, 76 students would have been candidates for the BS in Data Science given the number Math and CS courses they completed.

2. Will this program replace any existing programs or specializations, options, or concentrations? Yes ☐ No ☒

If yes, please explain.

3. Will the program compete with any current internal offerings? Yes ☒ No ☐

If yes, please explain.

The program is related to both Computer Science and Mathematics, which is why we are proposing a joint program. Students previously interested in majoring in either Computer Science or Mathematics may choose to major in Data Science instead; however, because students will be taking courses within Computer Science and Mathematics through the Data Science curriculum, the Credit Hour Production of the two programs should be comparable.



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D. Collaboration

Have collaborations with other institutions or external entities been explored? Yes ☐ No ☒

If yes, provide a brief explanation indicating those collaboration plan(s) for the proposed program.

Have any collaborations within your institution been explored? Yes ☒ No ☐

If yes, provide a brief explanation indicating those collaboration plan(s) for the proposed program.

The proposal is collaborative due to being a joint proposal between Mathematics and Computer Science. We have worked together to compose this proposal and the curriculum. The Capstone course will require collaborations with other departments on campus as well as industry partners (ex: Regions, BCBS, Shipt) to ensure the resulting project applies the students' data science knowledge to a specific problem domain.

E. Specialized Accreditation

1. Will this program have any external accreditation requirements in addition to the institution's SACSCOC program requirements? Yes ☐ No ☒

If yes, list the name(s) of the specialized accrediting organization(s) and the anticipated timeframe of the application process.

2. Does your institution intend to pursue any other non-required accrediting organizations for the program? Yes ☐ No ☒

If yes, list the name(s) of the organization(s) and the purpose of the pursuit.

If there are plans to pursue non-required external accreditation at a later date, list the name(s) and why the institution is not pursuing them at this time.

Note: Check **No** to indicate that non-required external accreditation will not be pursued, which requires no explanation.

F. Professional Licensure/Certification

Please explain if professional licensure or industry certification is required for graduates of the proposed program to gain entry-level employment in the occupations selected. Be sure to note which organization(s) grants licensure or certification.

None are required.

G. Additional Education/Training

Please explain whether further education/training is required for graduates of the proposed program to gain entry-level employment in the occupations selected.

No further training will be required.



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H. Admissions

Will this program have any additional admissions requirements beyond the institution's standard admissions process/policies for this degree level? Yes ☐ No ☒

If yes, describe any other special admissions or curricular requirements, including any prior education or work experience required for acceptance into the program.

I. Mode of Delivery

Provide the planned delivery format(s) (*i.e.*, in-person, online, hybrid) of the program as defined in policy along with the planned location(s) at which the program will be delivered (*i.e.*, on-campus and/or at specific off-campus instructional site(s)). Please also note whether any program requirements can be completed through competency-based assessment.

The program will be delivered in-person and on-campus; however, some courses may be offered online. Students can receive course credit through AP testing for MA 125 (Calculus).

J. Projected Program Demand (Student Demand)

Briefly describe the primary method(s) used to determine the level of student demand for this program using evidence, such as enrollments in related coursework at the institution, or a survey of student interest conducted (indicate the survey instrument used), number and percentage of respondents, and summary of results.

As evidence of current student interest, we polled the current UAB student body and found out of 417 undergraduate students who responded to the survey (all undergraduates were invited to participate – 13,032 as of Fall 2022, 3%), 128 (31%) reported they probably or definitely would major in the program, and 177 (42%) reported they probably or definitely would minor in the program. Moreover, 287 (69%) indicated an interest in data science, implying that while not all students will pursue a major or minor in the program, they will likely take some of the courses.

To understand the number of high school students interested in pursuing a BS in Data Science, we spoke with students at the UAB High School Programming Contest. Students were asked to take a chip, and if they wanted to study Data Science, they were asked to put the chip in a jar. 72% of students indicated they were interested in pursuing a minor or major in Data Science based on the total number in attendance and the number of chips in the jar.

We also used enrollment in the MS Data Science program at UAB as an indicator of student demand. Currently, the total number of students enrolled in Fall 2023 was 152, and this year's student application number is around 777. In the past four years, the enrollment has increased by 322%. The graduates of the proposed BS program in DS may choose to continue studying in the MS program in DS, as well as the other MS programs in Computer Science or Mathematics.

Based on the student interest and the 46% average year-to-year enrollment growth of the MS Data Science program, we projected a steady growth in enrollment as presented in number 3 below. We also factored in UAB's retention rate of 84.2% from Year 1 to Year 2.



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K. Standard Occupational Code System

Using the federal Standard Occupational Code (SOC) System, indicate the top three occupational codes related to post-graduation employment from the program. A full list of SOCs can be found at <https://www.onetcodeconnector.org/find/family/title#17>.

A list of Alabama's In-Demand Occupations is available at <https://www.ache.edu/index.php/policy-guidance/>.

SOC 1 (**required**): 15-2051.00 Data Scientists

SOC 2 (optional): 15-2041.01 Biostatisticians

SOC 3 (optional): 13-2099.01 Financial Quantitative Analysts

More detailed titles include, but are not limited to:

Business Intelligence Analyst

Credit Data Analyst

Data Analyst

Data Architect

Data Engineer

Data Modeler

Data Strategy Analyst

Machine Learning Engineer

Machine Learning Scientist

Operations Data Analyst

Product Insights Analyst

Quantitative Analyst

Quantitative Model Analyst

Briefly describe how the program fulfills a specific industry or employment need for the State of Alabama. As appropriate, discuss alignment with Alabama's Statewide or Regional Lists of In-Demand Occupations (<https://www.ache.edu/index.php/policy-guidance/>) or with emerging industries as identified by [Innovate Alabama](#) or the [Economic Development Partnership of Alabama](#) (EDPA).

Based on the information provided in Table 1, there is a high demand for Data Scientists in the state of Alabama as well as across the nation. While the Alabama statewide and Regional Lists of In-Demand Occupations do not specifically list "Data Scientist", every category listed requires data and will likely use one of the above titles to describe the position. Data Scientists can extrapolate the information within a field to provide a foundation for more strategic decision-making.

Currently, there are only two similar programs within the state, which cannot produce the number of employees needed in the field based on job postings within the state (Table 1). The proposed program by the University of Alabama at Birmingham requires courses in both Mathematics and Computer Science, which will increase the flexibility of graduates to apply their knowledge within various industries and will prepare the student to be competitive in any of the above positions.

To increase data literacy among our high school students, Innovate Alabama has been working with QuantHub to better prepare high school juniors and seniors to use data in their future careers. The proposed BS in Data Science will provide these high school students with a place to further develop their data literacy skills.



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The proposed program concludes with a Capstone Course, which will aim to partner students with local businesses and non-profits. This relationship will ideally result in more students staying in the state of Alabama.

III. Curriculum Information for Proposed Degree Program

- A. Program Completion Requirements: Enter the credit hour value for all applicable components (enter N/A if not applicable).

Curriculum Overview of Proposed Program	
Credit hours required in general education	41
Credit hours required in program courses	55
Credit hours in program electives/concentrations/tracks	15
Credit hours in free electives	9
Credit hours in required research/thesis	0
Total Credit Hours Required for Completion	120

Note: The above credit hours **MUST** match the credit hours in the *Curriculum Components of Proposed Program* table in Section V.G.

- B. Maximum number of credits that can be transferred in from another institution and applied to the program:
Following the current UAB policy, students may transfer up to half the required credit hours toward their UAB degree. The proposed program will follow the current UAB policy.
- C. Intended program duration in semesters for full-time students:
8 semesters to complete 120 hours.
- D. Intended program duration in semesters for part-time students:
This would be dependent on how many courses students completed each semester. Based on two courses per semester, it would take a student approximately 20 semesters to complete the 120 hours required by the full degree program.
- E. Does the program require students to demonstrate industry-validated skills, specifically through an embedded industry-recognized certification, structured [work-based learning](#) with an employer partner, or alignment with nationally recognized industry standards? Yes ☐ No ☒
If yes, explain how these components fit with the required coursework.
- F. Does the program include any concentrations? Yes ☐ No ☒
If yes, provide an overview and identify these courses in the *Electives/Concentrations/Tracks* section in the Curriculum Components of Proposed Program Table in Section V.G.



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- G. Please provide all course information as indicated in the following table. Indicate new courses with "Y" in the associated column. If the course includes a required work-based learning component, such as an internship or practicum course, please indicate with a "Y" in the WBL column.

Program Name:	Data Science			
Program Level:	Bachelor of Science			
Curriculum Components of Proposed Program				
Course Number	Course Title	Credit Hours	New ? (Y)	WBL ? (Y)
General Education BLAZER CORE – 41 HOURS				
Blazer Core	Local Beginnings	3		
Blazer Core	Academic Foundations	15		
Blazer Core	Thinking Broadly	17		
Blazer Core	City as a Classroom	3		
Free Elective	Free Elective	3		
Program Courses – 55 HOURS				
PHL 220	Ethics of Artificial Intelligence	3		
MA 125	Calculus I	4		
MA 126	Calculus II	4		
MA 160	Linear Algebra: Data and Models	3		
MA 189	Data Dive into Birmingham**	3		
MA 252	Introduction to Differential Equations	3		
MA 260 or MA 434	Introduction to Linear Algebra or Algebra I: Linear	3		
MA 485 or CS 355	Probability or Probability and Statistics in Computer Science	3		
MA 486	Mathematical Statistics	3		
CS 103	Introduction to Computer Science in Python	4		
CS 104	Data Science for All**	3		
CS 203	Object-Oriented Programming in Java	4		
CS 250	Discrete Structures	3		
CS 303	Algorithms and Data Structures	3		
CS 467	Fundamentals of Machine Learning	3		
CS 475	Fundamentals of Data Visualization	3		
CS/MA 499	Data Science Capstone	3		
Program Electives – 15 HOURS				
Two courses from the following, one must be at the 400-level				
MA 460	Mathematical Game Theory	3		



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MA 466	Introduction to Optimization	3		
MA 489	Stat Techniques for Machine Learning and Big Data	3		
Two courses from the following, one must be at the 400-level				
CS 380	Matrix Computation	3		
CS 410	Database Application Development	3		
CS 436	Fundamentals of Computer Security	3		
CS 460	Fundamentals of Artificial Intelligence	3		
CS 462	Fundamentals of Natural Language Processing	3		
CS 463	Fundamentals of Data Mining	3		
CS 473	Fundamentals of Computer Vision	3		
One course from the following				
BME 444	Machine Learning for Biomedical Engineering Applications	3		
BY 215	Introduction to Genomics	3		
CJ 483	Patterns in Crime	3		
EE 250	Engineering Problem Solving I	3		
INFO 302	Bioinformatics-I	3		
INFO 403	Bioinformatics-II	3		
INFO 412	Visual Analytics for Bioinformatics	3		
IS 418	Applied Data Science for Information Systems	3		
PH 104	Community Data Research	3		
PH 299	Reasoning through Modeling and Simulation of Data	3		
PH 418	Machine Learning Applications in Physics and Materials Science	3		
PSC 400	Data, Politics, and Policy	3		
PUH 230	Public Health Data and Methods	3		
PUH 250	Biostatistics	3		
PUH 350	Intermediate Biostatistics	3		
PUH 450	Statistical Programming and Database Analysis	3		
General Electives – 9 HOURS				
*Total Credit Hours Required for Completion		120		

***Note:** The total credit hours should equal the total credit hours in the Curriculum Overview table (V.B, p. 9).

******These courses are required in the degree but are part of the BlazerCore course offerings. Students can select them as part of BlazerCore or as additional courses.



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IV. Program Resource Requirements

A. Proposed Program Faculty*

Current Faculty and Faculty to Be Hired

Complete the following **New Academic Degree Proposal Faculty Roster** to provide a brief summary and qualifications of current faculty and potential new hires specific to the program.

***Note:** Institutions must maintain and have current as well as additional faculty curriculum vitae available upon ACHE request for as long as the program is active, but CVs are **not** to be submitted with this proposal.

Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
Jieyang Chen, FT	Fa23, CS 452, Algorithms, 3, UT Fa23, CS 652/752, Advanced Algorithms and Applications, 3, G Sp24, CS 629/729, GPU Programming, 3, G	PhD, Computer Science, University of California, Riverside	Research in high performance computing, GPU, big data management, big data analysis. Previous courses taught IP.
Alexandra Fedorova, PT	Fa23, CS 221, Web Development, 3, UT	MS, Information Systems Management, University of Alabama at Birmingham	14 years of industry experience. Previous courses taught IP.
Baocheng Geng, FT	Fa23, CS 250, Discrete Structures, 3, UT Sp24, CS 355/555, Probability & Statistics in CS, 3, UT/G Sp24, CS 665/765, Deep Learning, 3, G	PhD, Electrical and Computer Engineering, Syracuse University	Research in data science and machine learning. Previous courses taught IP and OL
Thomas Gilray, FT	Fa23, CS 350, Automata/Formal Languages, 3, UT Fa23, CS 660/760, Artificial Intelligence, 3, G Sp24, CS 401/501, Programming Paradigms, 3, UT/G	PhD, Computer Science, University of Utah	Research in static-analysis design, component verification, and program modeling. Previous courses taught IP.
Ragib Hasan, FT	Fa23, CS 436, Computer Security Fundamentals, 3, UT Fa23, CS 443, Fundamentals of Cloud Security, 3, UT Fa23, CS 636/736, Computer Security, 3, G Fa23, CS 643/743, Cloud Security, 3, G Sp24, CS 250, Discrete Structures, 3, UT Sp24, CS 423/623/723, Network Security Fundamentals, 3, UT/G	PhD, Computer Science, University of Illinois at Urbana-Champaign	Research in cloud security, Internet of Things, digital forensics, mobile malware security, secure provenance, biomedical device security, social network security, and database security. Previous courses taught IP, OL, and HY.
Truong Son Hy, FT	Starting Fall 2024	PhD, Computer Science, University of Chicago	



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
John Johnstone, FT	Fa23, CS 103, Introduction to CS in Python, 4, UT Fa23, CS 680/780, Matrix Algorithms for Data Science, 3, G Sp24, CS 350, Automata/Formal Languages, 3, UT Sp24, CS 680/780, Matrix Algorithms for Data Science, 3, G	PhD, Computer Science	Previous courses taught IP and OL
Jaret Langston, PT	Sp24, CS 489, Cyber Risk Management, 3, UT Sp24, CS 689, Cyber Risk Management, 3, G	PhD, Interdisciplinary Engineering, University of Alabama at Birmingham	20 years of industry experience. Previous courses taught IP.
Xi Li, FT	Starting Fall 2024	PhD, Computer Science and Engineering, Pennsylvania State University	
Ivan Mann, PT	Fa23, CS 355/555, Probability & Statistics in CS, 3, UT/G	PhD, Mathematics, University of Alabama at Birmingham	38 years of industry experience. Previous courses taught IP.
Rachel Moorehead, PT	Fa23, CS 332/532, Systems Programing, 3, UT/G Sp24, CS 332/532, Systems Programming, 3, UT/G	MS, Internet Technology, University of Georgia	21 years of industry experience. Previous courses taught IP.
John Osborne, PT	Fa23, CS 662/762, Natural Language Processing, 3, G	PhD, Computer Science, University of Alabama at Birmingham	Research in relationship between genotype and phenotype, natural language process. Previous courses taught IP.
Brandon Oubre, FT	Starting Fall 2024	PhD, Computer Science, University of Massachusetts Amherst	
Jonathan Perz, PT	Sp24, CS 457, Penetration Test/Vulnerability, 3, UT	MS, Cyber Security, University of Alabama at Birmingham	3 years of industry experience. Previous courses taught IP.
Claude Rivers, PT	Fa23, CS 476, Intro to Game Development, 3, UT	BS, Computer Science and Mathematics, Georgia College and State University	27 years of industry experience. AVP and Chief Technology Officer, UAB, AVP and Chief Information Security Officer, UAB. Previous courses taught IP.
Qing Tian, FT	Sp24, CS 303, Algorithms and Data Structures, 3, UT	PhD, Computer Science	Research in data science, machine learning. Previous courses taught IP.
Mahmut Unan, FT	Fa23, CS 303, Algorithms and Data Structures, 3, UT Fa23, CS 330, Comp Organization/Assembly Language, 3, UT Fa23, CS 332/532, Systems Programming, 3, UT/G Sp24, CS 203, Object-Oriented Programming, 4, UT Sp24, CS 330, Comp Organization/Assembly Language, 3, UT	PhD, Computer Science, University of Houston	Research in medical image analysis, medical robotics, digital image processing, algorithms and data structure, and computer organization. Previous courses taught IP and OL



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
Amber Wagner, FT	Fa23, CS 203, Object-Oriented Programming, 4, UT Fa23, CS300/500, Advanced OO Programming in C++, 3, UT/G Fa23, CS 499, Senior Capstone, 3, UNT Sp24, CS 103, Introduction to CS in Python, 4, UT Sp24, CS 420/520, Software Engineering, 3, UT/G Sp24, CS 499, Senior Capstone, 3, UNT	PhD, Computer Science, University of Alabama	Research in computer science education and accessible computing. Previous courses taught IP, OL, and HY
Tianyang Wang, FT	Fa23, CS 420/520, Software Engineering, 3, UT/G Sp24, CS 667/767, Machine Learning, 3, G	PhD, Computer Science, Southern Illinois University	Research in AI, machine learning, computer vision, broad data science, and biomedical informatics. Previous courses taught IP.
Steve Wingo, PT	Sp24, CS 334/534, Networking, 3, UT	PhD, Computer Science and Software Engineering, University of Alabama at Birmingham	57 years of industry experience. Previous courses taught IP.
Chengcui Zhang, FT	Fa23, CS 510, Database App Development, 3, G Fa23, CS 463/663, Fundamentals of Data Mining, 3, UT/G Fa23, CS 763, Data Mining, 3, G Sp24, CS 610/710, Database Systems, 3, G	PhD, Computer Science, Florida International University	Research in database systems, multimedia information retrieval, data mining, and machine learning. Previous courses taught IP, OL, and HY.
Yuliang Zheng, FT	Fa23, CS646/746, Blockchain and Cryptocurrency, 3, G Sp24, CS 645/745, Modern Cryptography, 3, G	PhD, Electrical and Computer Engineering, Yokohama National University	Research in cryptocurrency, cyber security, digital privacy, modern cryptography. Previous courses taught IP, OL, and HY.
Alexander Blokh, FT	Fa23, MA 125, Calculus I, 4, UT	PhD, Mathematics, Kharkov University, Ukraine	Research in Dynamical Systems.
Zoran Grujic, FT	Fa23, MA 440, Advanced Calculus I, 3, UT Fa23, MA 540, Advanced Calculus I, 3, G Sp24, MA 441, Advanced Calculus II, 3, UT Sp24, MA 541, Advanced Calculus II, 3, G	PhD, Mathematics, Indiana University, Bloomington	Research in applied analysis and mathematical physics.
Yulia Karpeshina, FT	Fa23, MA 260, Intro to Linear Algebra, 3, UT Fa23, MA 485, Probability, 3, UT Fa23, MA 585, Intro to Probability, 3, G Sp24, MA 260, Intro to Linear Algebra, 3, UT	PhD, Mathematics, Saint-Petersburg State University, Russia	Research in Mathematical physics.
Ian Knowles, FT	Fa23, MA 168, Math of Biological Syst I, 4, UT Sp24, MA 227, Calculus III, 4, UT Sp24, MA 361, Mathematical Modeling, 3, UT	PhD, Mathematics, Flinders University	Research in differential equations, inverse problems, number theory.



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
Elena Kravchuk, FT	Fa23, MA 105, Pre-Calculus Algebra, 3, UT Fa23, MA 106, Pre-Calculus Trigonometry, 3, UT Sp24, MA 105, Pre-Calculus Algebra, 3, UT Sp24, MA 106, Pre-Calculus Trigonometry, 3, UT	PhD, Mathematics, Institute for Applied Mathematics and Mechanics NASU	Teaching Pre Calculus, Calculus and Statistics.
Junfang Li, FT	Fa23, MA 180, Intro to Statistics, 3, UT Fa23, MA 418, Statistics for Teachers, 3, UT Fa23, MA 655, Partial Differential Equations, 3, G	PhD, Mathematics, University of Oklahoma	Research in Geometric analysis, Differential geometry, Partial differential equations.
Keren Li, FT	Fa23, MA 180, Intro to Statistics, 3, UT Fa23, MA 418, Statistics for Teachers, 3, UT Fa23, MA 498, Stat Tech Mach Learn & Big Dat, 3, UT Fa23, MA 598, Stat Tech Mach Learn & Big Dat, 3, G Sp24, MA 180, Intro to Statistics, 3, UT Sp24, MA 418, Statistics for Teachers, 3, UT	PhD, Statistics, University of Illinois at Chicago	Research in machine learning and statistics, especially in distributed learning.
Muhammad Mohebujjaman, FT	Fa23, MA 668, Numerical Analysis I, 3, G Sp24, MA 468, Numerical Analysis I, 3, UT Sp24, MA 568, Numerical Analysis I, 3, G	PhD, Applied and Computational Mathematics, Clemson University	Research in numeric analysis.
Carmeliza Navasca, FT	Fa23, MA 260, Intro to Linear Algebra, 3, UT Fa23, MA631, Linear Algebra, 3, G Sp24, MA 466, Introduction to Optimization, 3, UT Sp24, MA 566, Introduction to Optimization, 3, G Sp24, MA 660, Numerical Linear Algebra, 3, G	PhD, Applied Mathematics, University of California at Davis	Research in linear and multilinear algebra, numerical linear algebra, data sciences, optimization and control, and partial differential equations.
Marius N. Nkashama, FT	Fa23, MA 648, Complex Analysis, 3, G Sp24, MA 227, Calculus III, 4, UT	PhD, Mathematics, Catholic University of Louvain, Belgium	Research in nonlinear partial differential equations and applications, Nonlinear analysis, Continuous dynamical systems.
Lex G. Oversteegen, FT	Fa23, MA 126, Calculus II, 4, UT Fa24, MA 225, Calculus I, 4, UT Sp24, MA 670, Topology I, 3, G	PhD, Mathematics, Wayne State University	Research in mathematics, dynamical systems, and topology.



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
Tricia Phillips, FT	Fa23, MA 107, Precal Algebra/Trigonometry, 4, UT Sp24, MA 168, Math of Biological Syst I, 4, UT Sp24, MA 313, Patterns, Funct.& Alg Reasoning, 3, UT Sp24, MA 411, Integrating Mathematical Ideas, 3, UT Sp24, MA 511, Integrating Math Ideas, 3, G Sp24, MA 513, Patterns, Funct.& Alg Reasoning, 3, G	PhD, Mathematics, University of Tennessee	Research in Mathematical Biology, Applied Mathematics, Modeling and Simulations, Optimal Control Theory, Mathematics Education.
Nikita Selinger, FT	Fa23, MA 472, Geometry I, 3, UT Fa23, MA 572, Geometry I, 3, G Sp24, MA 126, Calculus II, 4, UT Sp24, MA 587/687, Advanced Probability, 3, G	PhD, Mathematics, Jacobs University Bremen	Research in combinatorics, number theory, group theory and ergodic theory.
Roman Shterenberg, FT	Fa23, MA 455, Partial Diff Equations I, 3, UT, Fa23, MA 486, Mathematical Statistics, 3, UT Fa23, MA 555, Partial Diff Equations I, 3, G, Fa23, MA 586, Mathematical Statistics, 3, G Sp24, MA 486, Mathematical Statistics, 3, UT Sp24, MA 586, Mathematical Statistics, 3, G	PhD, Mathematics, St. Petersburg St. Univ., Russia	Research in Mathematical physics, Functional analysis, Operator theory, Spectral theory, Scattering theory, PDE, Boundary problems, Inverse problems, Non-linear differential equations, Mathematical biology.
Nandor J. Simanyi, FT	Fa23, MA 260, Intro to Linear Algebra, 3, UT Fa23, MA 434, Algebra I: Linear, 3, UT Fa23, MA 534, Algebra I: Linear, 3, G Sp24, MA 435, Algebra II: Modern, 3, UT Sp24, MA 485, Probability, 3, UT Sp24, MA 534, Algebra I: Linear, 3, G Sp24, MA 585, Intro to Probability, 3, G	PhD, Mathematics, Roland Eötvös University, Budapest, Hungary	Research in Ergodic theory and dynamical systems with particular emphasis on systems with algebraic flavor.
Milena Stanislavova, FT	Fa23, MA 252, Intro Diff Equations, 3, UT Sp24, MA 252, Intro Diff Equations, 3, UT	PhD, Mathematics, University of Missouri-Columbia	Research in Dynamical Systems and Partial Differential Equations.



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
Shannon Starr, FT	Fa23, MA 180, Intro to Statistics, 3, UT Fa23, MA 360, Scientific Programming, 3, UT Fa23, MA 418, Statistics for Teachers, 3, UT Fa23, MA 560, Scientific Programming, 3, G Sp24, MA 252, Intro Differential Equations, 3, UT Sp24, MA 360, Scientific Programming, 3, UT Sp24, MA 560, Scientific Programming, 3, G	PhD, Mathematics, University of California Davis	Research in Probability theory, Quantum spin systems.
Atanas Stefanov, FT	Fa23, MA 640, MATHEMATICAL ANALYSIS I, 3, G Sp24, MA 641, MATHEMATICAL ANALYSIS II, 3, G	PhD, Mathematics, University of Missouri	Research in Analysis of Partial Differential Equations, in particular soliton and near soliton dynamics, local and global behavior of dispersive PDE, asymptotics for dissipative PDE.
Gunter Stolz, FT	Fa23, MA 260, Intro to Linear Algebra, 3, UT Sp24, MA 260, Intro to Linear Algebra, 3, UT	PhD, Mathematics, Goethe University Frankfurt, Germany	Research in mathematical physics.
Rudi Weikard, FT	Fa23, MA 227, Calculus III, 4, UT Fa23, MA 645, Real Analysis I, 3, G Sp24, MA 454, Interm Differential Equations, 3, UT Sp24, MA 454, Interm Differential Equations, 3, G Sp24, MA 646, Real Analysis II, 3, G	PhD, Mathematics, Technische Universität Braunschweig, Germany	Research in mathematical physics.
Yanni Zeng, FT	Fa23, MA 252, Intro Differential Equations, 3, UT Fa23, MA 650, Differential Equations, 3, G Sp24, MA 252, Intro Differential Equations, 3, UT Sp24, MA 461, Modeling With PDE, 3, UT Sp24, MA 561, Modeling With PDE, 3, G	PhD, Mathematics, New York University	Research in Partial differential equations, Nonlinear analysis, Conservation laws, Shock waves.
Henghui Zou, FT	Fa23, MA 227, Calculus III, 4, UT Sp24, MA 126, Calculus II, 4, UT	PhD, Applied Mathematics, University of Minnesota	Research in include Analysis and Partial Differential Equations.
Additional Faculty (To Be Hired)			
1	2	3	4
FACULTY POSITION (FT, FT)	COURSES TO BE TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)



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Current Faculty			
1	2	3	4
CURRENT FACULTY NAME (FT, PT)	COURSES TAUGHT including Term, Course Number, Course Title, & Credit Hours (D, UN, UT, G, DU)	ACADEMIC DEGREES and COURSEWORK Relevant to Courses Taught, including Institution and Major; List Specific Graduate Coursework, if needed	OTHER QUALIFICATIONS and COMMENTS Related to Courses Taught and Modality(ies) (IP, OL, HY, OCIS)
FT	Fa25, CS 460, Fundamentals of Artificial Intelligence, 3, UT Sp26, CS 462, Fundamentals of Natural Language Processing, 3, UT	PhD, Computer Science	Research in data science and artificial intelligence.
FT	Fa26, CS 463, Fundamentals of Data Mining, 3, UT Sp27, CS 473, Fundamentals of Computer Vision, 3, UT	PhD, Computer Science	Research in data mining.
FT	Fa25, MA 485, Probability, 3, UT Fa25, MA 585, Intro to Probability, 3, G Sp26, MA 687, Advanced Probability, 3, G	PhD, Mathematics	Research in probability and machine learning.

Abbreviations: (FT, PT): Full-Time, Part-Time; (D, UN, UT, G, DU): Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate, Dual: High School Dual Enrollment
Course Modality: (IP, OL, HY, OCIS): In-Person, Online, Hybrid, Off-Campus Instructional Site
Courses Taught/To be Taught – For a substantive change prospectus/application, list the courses *to be taught*, not historical teaching assignments.



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B. All Proposed Program Personnel

Provide all personnel counts for the proposed program.

Employment Status of Program Personnel		Personnel Information		
		Count from Proposed Program Department	Count from Other Departments	Subtotal of Personnel
Current	Full-Time Faculty	36	1	37
	Part-Time Faculty	8	0	8
	Administration			0
	Support Staff	8	0	8
**New To Be Hired	Full-Time Faculty	3	0	3
	Part-Time Faculty			0
	Administration			0
	Support Staff	2		2
Personnel Total				56

****Note:** Any new funds designated for compensation costs (Faculty (FT/PT), Administration, and/or Support Staff to be Hired) **should be included** in the **New Academic Degree Program Business Plan Excel file**. Current personnel salary/benefits (Faculty (FT/PT), Administration, and/or Support Staff) **should not be included** in the **Business Plan**.

Provide justification that the institution has proposed a sufficient number of faculty (full-time and part-time) for the proposed program to ensure curriculum and program quality, integrity, and review.

Both the Mathematics and Computer Science departments have qualified faculty; however, given the increase in students, Computer Science will require two additional faculty, one to be hired in Year 1, and one to be hired in Year 2. Mathematics will require one additional faculty member to meet the demand appropriately to be hired in Year 1. While the proposed program courses are currently offered, the frequency in offerings or number of sections will need to increase. The additional faculty will make that possible. Moreover, hiring additional faculty with a strong background in data science will allow for more specialized topics to be covered within the courses. Beyond faculty, both the Mathematics and Computer Science departments will need an additional TA to assist with grading and tutoring needs.

In the Business Plan Excel file, the new faculty costs were calculated as follows:

- Additional faculty for CS in Year 1: \$110,000+30%CFB, salary increased by 5% each year thereafter.
- Additional faculty for MA in Year 1: \$95,000+30%CFB, salary increased by 5% each year thereafter.
- Additional faculty for CS in Year 2: \$110,000+30%CFB, salary increased by 5% each year thereafter.
- One TA for Math and one TA for CS starting in Year 2.



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	Year 1	Year 2	Year 3+
CS Faculty	\$143,000	$\$143,000 + \$143,000 \times 1.05 = \$293,150$	Salaries plus 5%
Math Faculty	\$123,500	\$129,675	Salary plus 5%
TA		1 CS, 1 MA: \$18,000	\$18,000
Total	\$266,500	\$440,825	

C. Equipment

Will any special equipment be needed specifically for this program?

Yes ☐ No ☒

If yes, list the special equipment. Special equipment cost should be included in the **New Academic Degree Program Business Plan Excel file**.

D. Facilities

Will any new facilities be required specifically for the program?

Yes ☐ No ☒

If yes, list only **new** facilities. New facilities cost should be included in the **New Academic Degree Program Business Plan Excel file**.

Will any renovations to any existing infrastructure be required specifically for the program?

Yes ☐ No ☒

If yes, list the renovations. Renovation costs should be included in the **New Academic Degree Program Business Plan Excel file**.

E. Assistantships/Fellowships

Will the institution offer any assistantships specifically for this program?

Yes ☐ No ☒

If yes, how many assistantships will be offered?

The expenses associated with any *new* assistantships should be included in the **New Academic Degree Program Business Plan Excel file**.

F. Library

Provide a brief summarization (one to two paragraphs) describing the current status of the library collections supporting the proposed program.

The collections of the UAB Libraries are sufficient to support a Bachelor of Science degree in Data Science as they already provide support for the existing Master of Science degree in Data Science. Core resources include ACM Digital Library (Association for Computing Machinery) and IEEE Xplore (IEEE Computer Society) which provide full-text access to computer science magazines and journals, conference papers and proceedings, and books. The major databases available are Academic Search Premier, Applied Science & Technology, General Science, Scopus, Web of Science, Compendex, and MathSciNet. Many articles are immediately available to users through subscribed journal packages which include ACM Digital Library, IEEE Xplore, Elsevier Science Direct, Springer Link, and Wiley Online Library.

Other resources include purchased electronic book packages with many computer science and mathematics titles available on the following platforms: IEEE Xplore (Manning, MIT Press, Packt Publishing, and Wiley Data & Cybersecurity), ACM Digital Library, Elsevier



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Science Direct (Morgan Kaufmann), Springer Link, and Taylor & Francis (MATHnetBASE). In addition to the book packages, individual books from other scientific publishers are purchased in print or electronic format for the collection at the recommendation of the librarians and library users. Resources not owned or licensed by the UAB Libraries may be requested from other libraries throughout the world using the Interlibrary Loan service.

Will additional library resources be required to support the program?

Yes ☐ No ☒

If yes, briefly describe how any deficiencies will be remedied, and include the cost in the **New Academic Degree Program Business Plan Excel file**.

G. Accreditation Expenses

Will the proposed program require accreditation expenses?

Yes ☐ No ☒

If yes, briefly describe the estimated cost and funding source(s) and include cost in the **New Academic Degree Program Business Plan Excel file**.

H. Other Costs

Please explain any other costs to be incurred with program implementation, such as marketing or recruitment costs. Be sure to note these in the **New Academic Degree Program Business Plan Excel file**.

I. Revenues for Program Support

Will the proposed program require budget reallocation?

Yes ☐ No ☒

If yes, briefly describe how any deficiencies will be remedied and include the revenue in the **New Academic Degree Program Business Plan Excel file**.

Will the proposed program require external funding (e.g., Perkins, Foundation, Federal Grants, Sponsored Research, etc.)?

Yes ☐ No ☒

If yes, list the sources of external funding and include the revenue in the **New Academic Degree Program Business Plan Excel file**.

Please describe how you calculated the tuition revenue that appears in the **New Academic Degree Program Business Plan Excel file**. Specifically, did you calculate using cost per credit hour or per term? Did you factor in differences between resident and non-resident tuition rates?

The tuition revenue was calculated using an estimate of \$368/credit hour, averaging 12 hours per fall and spring semester, totaling \$8,832 annual tuition per student, taking into consideration the UAB retention and graduation rates.

ACADEMIC DEGREE PROGRAM PROPOSAL SUMMARY								
INSTITUTION:	University of Alabama at Birmingham							
PROGRAM NAME:	Data Science						CIP CODE:	30.7001
SELECT LEVEL:	UNDERGRADUATE (BACHELOR'S)							
ESTIMATED *NEW* EXPENSES TO IMPLEMENT PROPOSED PROGRAM								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	TOTAL
FACULTY	\$266,500	\$422,825	\$443,966	\$466,165	\$489,473	\$513,946	\$539,644	\$3,142,519
ADMINISTRATION/STAFF		\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$108,000
EQUIPMENT								\$0
FACILITIES								\$0
ASSISTANTSHIPS/FELLOWSHIPS								\$0
LIBRARY								\$0
ACCREDITATION AND OTHER COSTS								\$0
TOTAL EXPENSES	\$266,500	\$440,825	\$461,966	\$484,165	\$507,473	\$531,946	\$557,644	\$3,250,519
NEW REVENUES AVAILABLE FOR PROGRAM SUPPORT								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	TOTAL
REALLOCATIONS								\$0
EXTERNAL FUNDING								\$0
TUITION + FEES	\$176,640	\$309,120	\$556,416	\$865,536	\$1,183,488	\$1,545,600	\$1,987,200	\$6,624,000
TOTAL REVENUES	\$176,640	\$309,120	\$556,416	\$865,536	\$1,183,488	\$1,545,600	\$1,987,200	\$6,624,000
ENROLLMENT PROJECTIONS								
Note: "New Enrollment Headcount" is defined as unduplicated counts across years.								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	AVERAGE
FULL-TIME ENROLLMENT HEADCOUNT	No data reporting	6	14	22	27	33	43	24.17
PART-TIME ENROLLMENT HEADCOUNT		0	2	4	4	5	5	3.33
TOTAL ENROLLMENT HEADCOUNT		6	16	26	31	38	48	27.50
NEW ENROLLMENT HEADCOUNT		9	12	12	15	15	18	13.50
Validation of Enrollment			YES	YES	YES	YES	YES	
DEGREE COMPLETION PROJECTIONS								
Note: Do not count Lead "0"s and Lead 0 years in computing the average annual degree completions.								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	AVERAGE
DEGREE COMPLETION PROJECTIONS	No data reporting	0	0	3	5	8	14	7.50

Undergraduate Curriculum Plan

Undergraduate Curriculum Checklist:

- | | |
|--------------------------|--------------------------|
| 1. Overview | ☐ |
| 2. Components | ☐ |
| 3. Options (as required) | ☐ |

1. Undergraduate Overview

**Enter the credit hour value for all applicable components (N/A if not applicable).
The credit hours MUST match the credit hours in the Curriculum Components table.**

Curriculum Overview of Proposed Program	
Credit hours required in General Education	41
Credit hours required in Program Courses & Required Electives	55
Credit hours in Program Options (concentrations/specializations/tracks)	15
Credit hours in Free Electives	9
Credit hours in required Capstone/Internship/Practicum	0
Total Credit Hours Required for Completion:	120

Maximum number of credits that can be transferred in from another institution and applied to the program:	60
Intended program duration in semesters for full-time students:	8
Intended program duration in semesters for part-time students:	20

Does the program require students to demonstrate industry-validated skills, specifically through an embedded industry-recognized certification, structured work-based learning with an employer partner, or alignment with nationally recognized industry standards?:	YES	NO
	☐	☒

If **yes**, please explain (i.e., number of hours required, etc.):

	YES	NO
Does the program include any concentrations/ tracks/ options?	☐	☒
If yes , please explain (i.e., define):		

2. Undergraduate Components

Please provide all course information as indicated in the following table. Indicate new courses with “Y” in the associated column. If the course includes a required work-based learning component, such as an internship or practicum course, please indicate with a “Y” in the WBL column.

Insert Additional Rows as Needed				
Institution:	Select Institution Name			
Program Name:				
Program Level:	Select Award Level			
Curriculum Components of Proposed Program				
Course Number	Course Name	Credit Hours	New? (Y)	WBL? (Y)
General Education Courses				
Blazer Core	Local Beginnings	3		
Blazer Core	Academic Foundations	15		
Blazer Core	Thinking Broadly	17		
Blazer Core	City As a Classroom	3		
Free Elective	Free Elective	3		
Program Courses and Required Electives				
PHL 220	Ethics of Artificial Intelligence	3		
MA 125	Calculus I	4		
MA 126	Calculus II	4		
MA 160	Linear Algebra: Data and Models	3		
MA 189	Data Dive in to Birmingham	3		
MA 252	Introduction to Differential Equations	3		
MA 260 or MA 434	Introduction to Linear Algebra or Algebra I: Linear	3		
MA 485 or CS 355	Probability or Probability and Statistics in Computer Science	3		
MA 486	Mathematical Statistics	3		
CS 104	Data Science or All	3		
CS 203	Object-Oriented Programming in Java	4		
CS 250	Discrete Structures	3		
CS 303	Algorithms and Data Structures	3		
CS 467	Fundamentals of Machine Learning	3		
CS 475	Fundamentals of Data Visualization	3		
CS 103	Introduction to Computer Science in Python	4		
Program Options (enter total credit hours from all options below)				
Free Electives				
two from the following. One must be at the 400 level				
MA 460	Mathematical Game Theory	3		
MA 466	Introduction to Optimization	3		
MA 489	Stat Techniques for Machine Learning and Big Data	3		
Two courses from the following, one must be at the 400 level				
CS 380	Matrix Computation	3		
CS 410	Data Base Application Development	3		
CS 436	Fundamentals of Computer Security	3		
CS 460	Fundamentals of Artificial Intelligence	3		

CS 462	Fundamentals of Natural Language Processing	3	
CS 463	Fundamentals of Data Mining	3	
CS 473	Fundamentals of Computer Vision	3	
One course from the following			
BME 444	Machine Learning for Biomedical Engineering Applications	3	
BY 215	Introduction to Genomics	3	
CJ 483	Patterns of Crime	3	
EE 250	Engineering Problem Solving 1	3	
INFO 302	Bioinformatics 1	3	
INFO 403	Bioinformatics 2	3	
INFO 412	Visual Analytics for Bioinformatics	3	
IS 418	Applied Data Science for Information Systems	3	
PH 104	Community Data Research	3	
PH 299	Reasoning through Modeling and Simulation of Data	3	
PH 418	Machine Learning Applications in Physics and Materials Science	3	
PSC 400	Data, Politics, and Policy	3	
PUH 230	Public Health Data and Methods	3	
PUH 230	Biostatistics	3	
PUH350	Intermediate Biostatistics	3	
PUH 450	Statistical Programming and Database Analysis	3	
Capstone/Internship/Practicum			
CS/MA 499	Data Sceince Capstone	3	
Total Credit Hours Required for Completion:		120	

June 26, 2024

To Whom It May Concern:

I am Chair of the Board at Tech Birmingham Women in Technology (BWIT), dedicated to increasing, promoting, and advancing women in the Technology workforce.

With 20 years of IT experience, including a decade in senior leadership overseeing Application Development and IT Shared Services, I have led teams in deploying emerging technologies and business capabilities including Corporate Data and Analytics and Intelligence Automation with RPA (Robotics Process Automation).

I am writing to express our full support for adding an Undergraduate Degree in Data Science to the Computer Science academic programs offered at UAB.

The curriculum and hands-on projects with local companies will enhance students' employability and ensure they are well-prepared for the evolving field of data science.

By offering a Data Science bachelor's degree and providing an opportunity to gain experience as part of the program, UAB will play a crucial role in influencing the outcomes of the following goals and initiatives.

1. Keeping Talent Local, invest in our community and people, and support economic development initiatives.

Offering a local Data Science bachelor's degree program will attract talent and students to stay in our community. Therefore, fostering a continuous growth of the tech talent pool, generated with the increase in startups and companies moving their projects or operations to our community. Furthermore, boost innovation, promote knowledge sharing and collaboration, retain intellectual capital, and address local challenges through technology. Ultimately, ensuring a pipeline with continuous growth of local relevant tech talent will drive economic growth, create job opportunities, improve quality of life, and position our community as a leader in technological innovation.

2. Prepare for the Future of Work by reskilling/upskilling.

Offering a bachelor's degree in data science at UAB prepares our community for the evolving landscape of work shaped by advancements in technologies. Students will gain crucial skills in data analysis, machine learning, and AI, meeting the rising demand for data-driven decision-making in various domains, supporting varied industries in our region. This education will not only equip graduates to fulfill current job market needs but also supports continuous reskilling and upskilling, empowering professionals in our community to succeed in a rapidly changing workplace environment.

3. Increase women's representation in tech, enhance UX, and advocate for responsible AI in tech innovation.

BWIT collaborates with community leaders to promote workforce diversity, addressing a key barrier for women in tech careers: awareness of compelling career paths aligned with their interests and job satisfaction. Data Science has emerged as particularly attractive, evidenced in increased interest among our members, according to our member surveys, and strong participation in AI and Data & Analytics programs. This trend is driven by opportunities for impactful innovation, competitive salaries, and the flexibility to apply skills across industries, propelling women to leadership roles. We look to UAB to support this momentum by offering a bachelor's degree in data science, which will attract more women to technology careers and inspire others as role models in the field.

The evolving landscape of emerging technologies demands increased participation of women in tech roles. Enhancing opportunities for women in these careers will significantly bolster technology innovation. Women bring a unique blend of skills—such as a user-centric approach, empathy, creativity, critical thinking, ethical considerations, and leadership—that are essential for developing solutions that elevate user experience. Their diverse perspectives and experiences play a pivotal role in creating AI-enabled systems and applications that uphold ethics, fairness, and impartiality, while prioritizing user-centric design.

In conclusion, Birmingham Women in Technology fully supports the new Bachelor of Data Science at UAB. This program will enrich UAB's offerings, attracting a diverse group of talented students, including many women eager to excel in this dynamic field. It strengthens our commitment to fostering technology innovation, enhancing an inclusive tech workforce, and driving economic growth within our community and tech ecosystem.

Thank you for considering my perspective on this matter. I look forward to collaborating with UAB and promoting this program and Data Science as a career path with our networks.

If you have further questions, please feel free to reach out to me.

Sincerely,

Ronit Ron
Chair of the Board, Birmingham Women in Technology

A handwritten signature in cursive script that reads "Ronit Ron".

May 27, 2024

To Whom It May Concern:

I am a former graduate student from UAB, and I currently work as a Data Scientist at Telligen. My regular responsibilities include designing healthcare Business Intelligence solutions, engineering data pipelines, and building/managing health economics forecasting models. I have reviewed the planned curriculum for the proposed Bachelor of Science in Data Science program at the University of Alabama at Birmingham. Given my experience working in this field, I feel the curriculum will prepare students to be successful working in data science.

Data science is a timely field in that all companies are exploring ways to make better use of the data they possess to make better informed decisions. Students graduating with these skills will be in high demand. Moreover, the rise of Artificial Intelligence will create an even higher demand for individuals who understand how to process data and use it effectively in model development.

Regarding the planned curriculum, all of the foundational topics are well covered. Because the program consists of math and computer science courses, the graduates will be versatile and will be able to apply their knowledge to a variety of data science positions. Requiring a course outside of math and computer science will give students the opportunity to explore how data is used in other subjects. Finally, the Capstone course requiring students to complete a hands-on, real-world project will allow students to see a project through from requirements gathering to presentation. Asking students to work with a company or non-profit for this project enhances the real-world applications and will enable students to better understand what projects may be like in the work force. Data science position openings often request project portfolios, so getting students started on topics that interest them will help launch their careers with advantage.

In closing, I support the proposed Bachelor of Science in Data Science, and I believe it will be an excellent and timely addition to the curriculum offered by UAB.

Please feel free to contact me with any additional questions.

Sincerely,

J. Mac Delay, MSPH
Data Scientist
Telligen, Inc.

A handwritten signature in black ink, appearing to read 'J. Mac Delay', with a long horizontal flourish extending to the right.



June 10, 2024

To Whom It May Concern:

I am currently a Senior Data Scientist at AXS, a leading technology company specializing in ticketing. At AXS, I utilize data science skills in my position. My role involves analyzing large datasets to uncover trends and insights, developing predictive models to drive business decisions, and optimizing processes through data-driven solutions. I have reviewed the planned curriculum for the proposed Bachelor of Science in Data Science program at the University of Alabama at Birmingham. Given my experience working in this field, I feel the curriculum will prepare students to be successful working in data science.

Data science is a timely field in that all companies are exploring ways to make better use of the data they possess to make better informed decisions. Students graduating with these skills will be in high demand. Moreover, the rise of Artificial Intelligence will create an even higher demand for individuals who understand how to process data and use it effectively in model development.

Regarding the planned curriculum, all of the foundational topics are well covered. Because the program consists of math and computer science courses, the graduates will be versatile and will be able to apply their knowledge to a variety of data science positions. Requiring a course outside of math and computer science will give students the opportunity to explore how data is used in other subjects. Finally, the Capstone course requiring students to complete a hands-on, real-world project will allow students to see a project through from requirements gathering to presentation. Asking students to work with a company or non-profit for this project enhances the real-world applications and will enable students to better understand what projects may be like in the work force.

In closing, I support the proposed Bachelor of Science in Data Science, and I believe it will be an excellent and timely addition to the curriculum offered by UAB. This program will not only equip students with essential technical skills but also provide them with practical experience that is crucial in today's job market.

Please feel free to contact me with any additional questions.

Sincerely,

Zirui Roger Wang
Senior Data Scientist
AXS

A handwritten signature in black ink, appearing to read 'Zirui Wang', written over a light blue grid background.

University of Alabama at Birmingham

Program or Item	Full Proposal: Data Science BS
School or College	College of Arts and Sciences
Submission:	Dr. Yuliang Zheng, Department of Computer Science yzheng@uab.edu / (205) 934-8655
Senate Submission	February 2025

Approval

Signature

Dr. Yuliang Zheng, Dept of Computer Science



Dr. Milena Stanislavova, Dept of Mathematics



Dean Kecia Thomas, College of Arts & Sciences



THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Resolution

Granting Initial Approval and Submission to the Alabama Commission on Higher Education (ACHE) a Proposal for a Bachelor of Science (B.S.) Degree in Data Science (CIP Code 30.7001)

WHEREAS, the College of Arts and Sciences at The University of Alabama at Birmingham received feedback about its Notice of Pending Proposal (NPP) for a New Program of Instruction from The University of Alabama System campuses for the Bachelor of Science (B.S.) degree in Data Science on April 9, 2025; and

WHEREAS, UAB currently offers a Bachelor of Science degree in Computer Science; and

WHEREAS, UAB currently offers a Bachelor of Science degree in Mathematics; and

WHEREAS, the use of data collection, cleaning, modeling, and analysis in all aspects of human life has resulted in the integration of data science into all fields of study; and

WHEREAS, the proposed program will prepare students with interests in the use of data to apply data science skills in performing data analysis related to science, arts, business, engineering, the humanities, as well as other areas; and

WHEREAS, the program seeks to provide a deep understanding of data science as it relates to other fields, specifically with the broad use of artificial intelligence; and

WHEREAS, the proposed program will be administered by the Department of Computer Science and the Department of Mathematics in the College of Arts and Sciences;

NOW, THEREFORE, BE IT RESOLVED by The Board of Trustees of The University of Alabama that it grants initial approval of and submission to the Alabama Commission on Higher Education (ACHE) a Proposal for a Bachelor of Science (B.S.) degree in Data Science (CIP Code 30.7001) by The University of Alabama at Birmingham.

RAY L. WATTS, M.D.

President

July 24, 2025

Chancellor Sid J. Trant
The University of Alabama System
500 University Boulevard East
Tuscaloosa, AL 35401

Dear Chancellor Trant:

The College of Arts and Sciences at UAB proposes to establish a Bachelor of Science (B.S.) degree in Data Science. The proposed program will provide students with the knowledge, skills, and training necessary to practice as data scientists in the United States or internationally. The program is a collaborative proposal between the departments of Mathematics and Computer Science. Connecting these two fields strategically enables students to develop skills based on the core theories of data science techniques. Gaining new skills in data science depends on a solid understanding of these fundamental theories, and our graduates will be well equipped.

The proposal has been thoroughly reviewed here at UAB and has my full support. If you approve, please include this item on the Board's agenda for its September 12, 2025 meeting and then forward it to the Alabama Commission on Higher Education. If additional information is needed, we will be pleased to provide it.

Sincerely,



Ray L. Watts, M.D.
President

RLW:khm

Attachments

cc: Dr. Janet Woodruff-Borden
Dean Kecia Thomas
Mrs. Kirsten Burdick
Dr. Tonja Johnson

Office of the President

1070 Administration Building | 701 20th Street South

Mailing Address:

AB 1070 | 1720 2ND AVE SOUTH | BIRMINGHAM AL 35294-0110

phone: 205.934.4636

uab.edu

July 22, 2025

MEMORANDUM

TO: Ray Watts, M.D.
President

FROM: Janet Woodruff-Borden, Ph.D.
Senior Vice President for Academic Affairs and Provost

SUBJECT: Academic Affairs Program Items for September 12, 2025, Board of Trustees Meeting

For the September 12, 2025, Board of Trustees meeting, we are submitting the following Academic Affairs items from the following UAB Deans:

Teresa Taber-Doughty, Dean of the School of Education and Human Sciences

- Discontinue the Collaborative Teacher Autism Concentration of the EdS in Education (CIP Code 13.0101)
- Discontinue the English as a Second Language Concentration of the EdS in Education (CIP Code 13.0101)
- Discontinue the Teacher Leader Concentration of the EdS in Education (CIP Code 13.0101)
- Discontinue Visually Impaired Concentration of the MA in Education in Special Education (CIP Code 13.1001)

Kecia Thomas, Dean, College of Arts and Sciences

- BS Data Science (CIP Code 30.7001)
- Online Modality Master Public Administration (CIP Code 44.0401)
- Name and CIP Code Change MS Data Science to Artificial Intelligence (CIP Code 11.0102)

Paul C. Erwin, Dean, School of Public Health

- Name Change MSPH Concentration in Environmental and Occupational Health Science to Environmental Health Sciences (CIP Code 51.2201)

David Schneider, Interim Dean, Graduate School

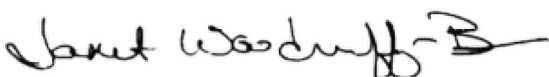
- Name Change Mentoring and Leadership to Mentoring and Reflective Professional Practice (CIP Code 30.999)
- Discontinue Postdoctoral Professional Development Graduate Certificate (CIP Code 35.0103)

Christopher L. Shook, Dean, Collat School of Business

- Name Change Graduate Certificate Digital Marketing to Marketing in the Digital Era (CIP Code 52.1404)
- Name Change Graduate Certificate Information Technology Management to Information Technology Operations and Strategy (CIP Code 52.1201)
- Graduate Certificate on Business Leadership and Professional Growth (CIP Code 52.0213)
- Graduate Certificate on Financial Analytics for Decision Making (CIP Code 30.7104)
- Graduate Certificate on Business in the Health Sector (CIP Code 51.0701)

These requests have my full endorsement for submission to the Board of Trustees for review and approval at their September 12, 2025, meeting. Please let me know if you have any questions.

JWB/khm



Janet Woodruff-Borden, Ph.D.
Senior Vice President for Academic Affairs and Provost

Executive Summary

The proposed Bachelor of Science in Data Science (BSDS) degree program will be a new degree within the Departments of Mathematics and Computer Science within the College of Arts and Sciences at the University of Alabama at Birmingham. This program will be in addition to the already existing master's degree program in DS within the Department of Computer Science. The proposed program is an undergraduate level program that will provide students the knowledge, skills and training needed to practice as data scientists in the United States or internationally. There is currently a high demand for data scientists in the city of Birmingham, state of Alabama, and throughout the United States as job openings are predicted to increase by 36% over the next ten years (BOL, 2025). This program is timely from UAB's perspective because it will help alleviate this shortage by increasing the number of DS graduates each academic year. Given the explosion of AI, more data scientists will be needed to properly collect, clean, and analyze the data fed to AI.

Currently, students wanting to pursue data science, complete both the BS in Mathematics and the BS in Computer Science at UAB. The dual BS degrees are necessary due to the heavy intertwining of mathematics and computer science skills required by data science. Computer science students generally require more mathematics, and mathematics students require more computer science. The new multidisciplinary degree combines the necessary courses from both computer science and mathematics into one BS degree, which will be open to all undergraduate students. The fully integrated and complementary course design will enable a rigorous and comprehensive curriculum for a BS degree in Data Science. The curriculum has been carefully designed to ensure a strong foundational understanding of the theoretical and computational methodologies in mathematics and computer science. Additionally, a breadth of well-balanced courses in data analysis with domain emphasis is offered to solidify how the mathematics and computer science courses apply to the field of Data Science. Upon completing the BS in Data Science, students will have the opportunity to further their education with the MS in Data Science program.

There are three similar programs offered in the state of Alabama:

1. University of Montevallo offers a BS in Data Analytics; however, the proposed program by UAB requires significantly more math courses.
2. University of Alabama offers a BS in Data Science; however, it requires fewer computer science courses than the proposed program by UAB.
3. University of Alabama at Huntsville offers a BS in Computer Science with a Data Science concentration, which does not include as much math nor specialized courses in data science as the proposed program by UAB.

The proposed program differs from the existing programs in the state of Alabama due to the inclusion of an equal number of Math and CS courses, which delve deeper into the theories behind the Math and CS used in data science. It is the Math courses that truly differentiates the proposed program from the programs offered by the University of Montevallo and the University of Alabama at Huntsville. The opposite is the case for the University of Alabama, whose program is Math intensive where UAB's proposed program requires more CS. Moreover, a strength of the CS department at UAB is cybersecurity. The importance of data security and the ethics of collecting, storing, and analyzing data will be intertwined throughout the program.

While there are no specific pre-requisites for beginning the BSDS program, it is recommended that students are prepared to take Calculus I (MA125) in their first year.

The BSDS program will have five major strengths. These strengths will be as follows:

1. The program is a joint proposal between the Departments of Mathematics and Computer Science. Strategically intertwining these two disciplines empowers students to build competencies from the foundational theories behind data science techniques. Learning new techniques in data science requires a strong understanding of the foundational theories, and our graduates will be well prepared.
2. The proposed program includes a senior capstone course requiring students to develop a data science project with real-world applications. Most projects in this course will come from local industry or non-profit partners, forcing students to put the theoretical framework they learned into practice.
3. Data Science is an in-demand degree for which demand will only increase as the applications of AI continue to expand. As AI models continue to be improved, the data being used to train those models will become even more important. Graduates of this program will understand not only the techniques to collect, clean, and analyze data, but they will also learn the ethics surrounding data collection and analysis.
4. The curriculum in the proposed program will expose students to cutting edge technologies used in data mining and analysis along with the critical thinking skills to choose the best tools for solving a given problem.
5. An increase in data requires the need for increased security. Graduates of the proposed program will have a strong understanding of the security and privacy issues involved in data collection and storage as well as the ethics of using that data.

The proposed BSDS curriculum will be delivered in face-to-face format and is a four-year program. The total of 120 credit hours will be divided as follows: 41 credit hours will come from General Education Core courses, 70 credit hours will come from program courses, which will include 15 hours of program electives; 9 credit hours will come from free electives.

The proposed BSDS program will be evaluated by assessing students' performance on course examinations, student learning outcomes (SLO's) and by graduate and employment surveys. The survey instruments will address the graduate's aptitude in technical knowledge and communication skills.

The proposed program will require three new faculty resources within the next two years. An additional faculty in Math and two additional faculty in Computer Science are needed to support sustainability since we will need to manage more courses and more student advising. Based on historical data, its reasonably possible that our enrollment numbers will increase heavily. While the proposed program courses are currently offered, the frequency in offerings or number of sections will need to increase. The additional faculty will make that possible. Moreover, hiring additional faculty with a strong background in data science will allow for more specialized topics to be covered within the courses. Beyond faculty, both the Mathematics and Computer Science departments will need an additional TA to assist with grading and tutoring needs.

There is a remarkable amount of community support for this degree program as evidenced by letters of support from Tech Birmingham and Telligen.

In summary, this proposed program will help address a specific and crucial technical need, not only in Alabama, but nationwide. This program will prepare students to accurately, efficiently, and securely collect, maintain, and analyze data in an increasingly data-driven world.

United States Bureau of Labor Statistics (BOL). Retrieved from <https://www.bls.gov/ooh/math/data-scientists.htm> on May 26, 2025.



Board Rule 502
Notice of Pending Proposal (NPP) for a New Program of Instruction

(To be completed by the Provost's Office)

1. Institution

(Please select more than one institution for cooperative, joint, and shared degree programs.)

- UAB

2. Date of NPP Submission (mm/dd/yyyy):

03/05/2025

3. Contact Information

<i>Institutional Contact Person:</i>	Yulang Zheng
<i>Telephone:</i>	2052-934-8657
<i>Email:</i>	yzheng@uab.edu

4. Program Identification

<i>Program Name:</i>	Data Science
<i>Degree Nomenclature:</i>	B.S.

5. CIP Code

<i>2-digit CIP Code:</i>	30 MULTI/INTERDISCIPLINARY STUDIES
<i>4-digit CIP Code:</i>	30 MULTI/INTERDISCIPLINARY STUDIES ~ 30.70 Data Science
<i>6-digit CIP Code:</i>	30 MULTI/INTERDISCIPLINARY STUDIES ~ 30.70 Data Science ~ 30.7001 Data Science, General

6. Program Mode of Delivery

Provide the planned delivery format(s) (i.e., in-person, online, hybrid) of the program along with the planned location(s) at which the program will be delivered (i.e., on-campus and/or at specific off-campus instructional site(s)). Please also note whether any program requirements can be completed through competency-based assessment.

- In-person

7. Select a meeting for Board consideration:

- June 5-6, 2025

8. Is the proposed academic degree program currently listed on your campus Three-Year Academic Program Planning Report that is annually submitted to the Board of Trustees?

- Yes

9. Provide a brief description of the program.

Brief Description of Program and Objectives:

Our modern world is inundated with data and jobs that require data analysis skills. With so much data, there is more demand for people who can understand and interpret data in a meaningful way. Undergraduate degrees in data science are now a prevalent undergraduate program in many universities and colleges in the US. This rise in the number of degree programs in data science is driven by the growth in the demand for occupations in further advancing artificial intelligence (AI). This trend is present in Alabama.

To address the high demand in job opportunities in AI technology, the Department of Computer Science (CS) and the Department of Mathematics (MATH) at the College of Arts and Sciences (CAS) in the University of Alabama at Birmingham (UAB) propose to establish a joint undergraduate program in Data Science. This new undergraduate program is built on the success of the MS program in Data Science established by the Department of Computer Science in 2018. The MS program has flourished within the past four years, enrolling 156 students in Fall 2022, contributing to the production of data science workforce to meet the large demand projected by the Bureau of Labor Statistics.

At the current state, UAB students with dual BS degrees in Computer Science and Mathematics have carefully and successfully navigated through our existing courses with the auspices of both departments, harnessing desirable and marketable skill sets. The new joint program will be for all undergraduate major students. A fully integrated and complementary course design will enable a rigorous and comprehensive curriculum for a BS degree in Data Science. The curriculum will be carefully designed to ensure strong foundational understanding of the theoretical and computational methodologies in mathematics and computer science as well as to offer a breadth

of well-balanced courses in data analysis with domain emphasis, forging the connection to data science. Furthermore, the BS degree in Data Science will be aligned with and facilitate the continuation of education and training with the established MS in Data Science.

By the end of the program students will be able to:

Effectively communicate the results of data analysis in the forms of writing, presentation, and visualization.

Think critically about the construction and implications of data analysis and models

Make sound decisions and draw conclusions from data in context using:

- (a) statistical inference and applied statistics
- (b) computational methods and algorithm design
- (c) modeling and learning techniques
- (d) data structures, data visualization and data management strategies
- (e) domain knowledge
- (f) theoretical foundations of linear algebra, optimization, and probability
- Understand the human, societal and ethical implications of data analytics

10. Relationship of program to other programs within the institution.

10.1. How will the program support or be supported by other programs within the institution?

The Department of CS has already established a strong and successful MS (Master of Science) program in Data Science. Currently, the total student enrollment of this program has reached 156 in Fall 2022 and this year's student application number is around 900. The graduates of the proposed BS program in OS may choose to continue studying in the MS program in OS, as well as the other MS programs in Computer Science or Mathematics.

This proposed BS OS program is a joint and collaborative effort between the Department of Mathematics and the Department of Computer Science within the College of Arts and Sciences. The Mathematics department has an undergraduate BS degree program in four tracks: traditional, traditional with honors, mathematical reasoning and applied mathematics/scientific computation. The course requirements for these sub-track programs are distinct from the proposed BS program in Data Science, especially when they do not require computer science courses.

The Computer Science department has four undergraduate programs: BS in Computer Science, BA in Computer Science, BS in Bioinformatics, and BS in Digital Forensics. The course requirements for these programs are different from the proposed BS program in Data Science, especially when they do not require a few Math courses important for Data Science such as advanced linear algebra and statistics inference.

Math and CS have a good and long-standing track record of collaboration. In addition, further collaborations between the two departments are facilitated by their physical location on the same floor in the University Hall building at UAB.

10.2. Will this program replace any existing program(s) or specialization(s), option(s) or concentration(s) within existing programs?

- No

11. If this program is similar or duplicative of any other programs in the system or the state, please give your rationale for program duplication.

N/A

12. Do you plan to explore possible program collaboration with other institutions? Please explain.

We will consider this after the program is implemented.

13. Please describe the need and/or level of student demand for this program.

N/A

Attachment C to Board Rule 502
New Program Proposal Supplement

Feedback from NPP

Feedback from the Chair of the UA Department of Mathematics (Tiziana Giorgi):

Overall, UA supports this program, however, we do offer a similar program.

The N/A answer to Section 11 (If this program is similar or duplicative of any other programs in the system or the state, please give your rationale for program duplication) is not accurate. The University of Alabama at Tuscaloosa (UA) Data Science, BS program, is similar both in content and structure. The UA Data Science, BS program is jointly provided between the UA Departments of Mathematics and Computer Science and fully implemented since Fall 2024. However, it should be noted that because of the widespread need of efficiently analyze large data sets, data science is by now a major offered at most US institutions and it is to be expected to have very similar programs at different institutions, similarly to what happens with Mathematics and Computer Science programs.

Feedback from the Computer Science Chair and Science Dean at UAH:

Data Science is without question a high-demand area, and this proposed B.S. in Data Science looks like a very useful contribution to help meet this demand. With an established M.S. in Data Science at UAB in place already, this new undergraduate program is a natural addition to the curriculum, and its joint implementation by CS and MATH is a natural home for this type of degree. At UAH we have a pathway with a data science focus in the CS curriculum, but this pathway differs from this new multidisciplinary program, targeting a different student population, and the proposed new program is a very valuable and welcome addition to the University of Alabama System's program portfolio.