Abilene Approval Chart for Curriculum Changes

A = Approve I = Information Item R = Respond In Writing

Course Number: or Degree Plan(s): New Program - Data Science and Statistics

	Campus-Level Academic Review[1]	Dept./School	College	Dean	TEC	AUAC/Grad	Provost
	Change to a Course Include signatures from all chairs/program directors for cross-listed courses.[1]						
1.	Title (description unchanged)	A	A	A	I	I	I
2.	Description (not affecting content)	A	A	A	I	I	I
3.	Course term(s)	A	I	A	I	I	I
4.	Content (change of course outcomes)	A	A	A	I	I	A
5.	Number of credit hours	A	A	A	A	A	A
6.	Course number within the hundred	A	A	I	I	I	I
7.	Course number beyond the hundred	A	A	A	A	A	A
8.	Prerequisites	A	A	A	I	I	I
9.	Course restriction (e.g., majors only, junior standing)	A	A	A	A	A	A
10.	Level change (U to G *or* G to U)	A	A	A	A	A	A
11.	Cross list course	A	A	A	A	A	A
12.	Department of record	A	A	A	A	A	A
13.	Open or close a course	A	A	A	A	A	A
	Change to a Degree Plan						
14.	Educational Program — Revise	A	A	A	A	A	A
15.	Educational Program — Adopt/revise admission requirements	A	A	A	A	A	A
16.	GPA — Revise program-required GPA	A	A	A	A	A	A
17.	Minor — Revise	A	A	A	A	A	A

	Full Review	Dept./School	College	Dean	TEC	AUAC/Grad	Provost	Campus Faculty	Senior VPAA	President
	Change to Catalog Information (for Campus)									
18.	General requirements for Bachelor's and Associate Degrees	–	–	–	–	A	A	A	A	I
19.	Policies governing academic probation and suspension	–	–	–	–	A	A	A	A	I
20.	Requirements for graduating with honors	–	–	–	–	A	A	A	A	I
	Change to a Degree Plan									
21.	Educational Program — Add or Discontinue[2] [3]	A	A	A	A	A	A	A	A	I
22.	Educational Program — Discontinue (Provost-proposed)	R	–	R	A	A	A	A	A	I
23.	Minor — Add or Discontinue	A	A	A	A	A	A	–	A	I
24.	Minor — Discontinue (Provost-proposed)	R	–	R	A	A	A	–	A	I
25.	Degree — Add or Discontinue	A	A	A	A	A	A	A	A	I
26.	Degree — Discontinue (Provost-proposed)	R	–	R	A	A	A	A	A	I

	Change to General Education Requirements for Undergraduates (System)	Dept./School	College	Dean	AUAC	Provost	UGEC	University Faculty	Senior VPAA	President
27.	Change course outcomes of an included course	A	A	A	A	A	A	–	A	I
28.	Add or drop a required course from the General Education Requirements	A	–	A	–	A	A	A	A	I
29.	Add or drop a course from a menu within the General Education Requirements	A	–	A	–	A	A	–	A	I
30.	Comprehensive revision of General Education Requirements	–	–	–	–	A	A	A	A	I

Notes

[2] Any change to a cross-listed course requires the signature of both department chairs or program directors overseeing the course to ensure that the courses stay in sync. This includes courses taught at other campuses (e.g. BIBL 101 and BIBO 101).

[3] For undergraduate majors, a minimum of 30 hours is required. These programs must have a minimum of 6 elective hours, unless the requirements of external accrediting bodies make it impossible. Master's programs must include a minimum of 30 hours, and doctoral programs must include a minimum of 30 hours beyond the master's.

[4] When a department/school or dean proposes closing a program, approval routing follows the typical process beginning with the department/school. An administrative proposal by the provost or senior vice president for academic affairs would follow the "provost-proposed" routing on the chart.

Updated 8/1/2023

Department/School(s)

John Ehrke 2/18/2026

Chair Signature Date

Chair/Program Director Signature Date

College Academic Council(s)

Chair Signature Date

Chair Signature Date

Dean(s)

Signature Date

Signature Date

Teacher Education Council

Signature Date

Campus Academic Council:
Abilene Undergraduate or Abilene Graduate

Signature Date

Provost

Signature Date

University General Education Council

Signature Date

University Faculty

Abilene Faculty Senate Chair signature Date

Dallas Faculty Council Chair signature Date

Senior Vice President for Academic Affairs

Signature Date

President

Signature Date

Abilene New Program Application

Step 1: Campus Coordination Information

1. Program Identification
    A. Program title
        i. Data Science and Statistics
        ii. SDS is a commonly accepted moniker that we will use for Course Prefixes
    B. Degree type
        i. Bachelor of Science - Data Science and Statistics (BS DSS)

    C. Home department or school
        i. Onstead College of Science and Engineering
        ii. Mathematics Department

    D. Program developer(s) and credentials
        i. John Ehrke, Ph.D. Mathematics - Differential Equations - Baylor University
        ii. Randy Nguyen, Ph.D. Statistics - Biostatistics Concentration - Baylor University

    E. Where program will be offered and delivery method
        i. Abilene Residential - Face to Face Delivery - Mathematics Department

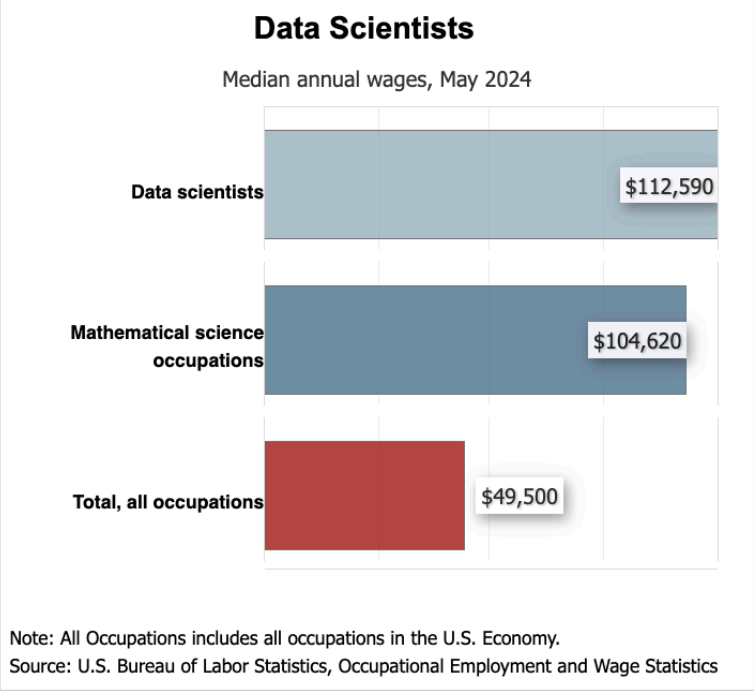
    F. Proposed date of implementation
        i. Fall 2026

2. Program Overview
    A. Outlook
        1. Market need. What students will be drawn to this program? What types of careers will they pursue after graduation? What is the job market/outlook l ike in this area?
            1. It's hard to think of a degree on campus that has a higher market need. ACU Dallas has expressed keen interest in helping fund expansion of this program to write curriculum for its programs once established. In talking with George Saltsman there is a high level of corporate interest in these programs and creating pipelines of graduates with data analytics skills through ACU residential and ACU Dallas.
            Moreover, the new courses developed to launch this degree have wide applicability to other departments on campus that seek to raise the data analytics and quantitative skills of their majors. Indeed, several departments have already inquired about adding our new courses like MATH 387 - Data Visualization in R and Python to their degrees.

Students interested in this program include any student interested in science from a computational perspective. It has tremendous appeal to the areas of business, computer science and healthcare. For these reasons, our track is designed to encourage interdisciplinary exploration in these areas. I also suspect a large number of mathematics students will declare this track as well.

Upon graduation, students completing this degree will be sought after by healthcare companies, insurance companies, banking and financial services, government, aerospace and defense contractors, higher education, telecommunications, sports, corporate research and operations teams, etc.. Most of the jobs will ask graduates to do the same basic tasks of data wrangling, data management and analysis, while some will demand higher level skills involving algorithm creation, or deliverables across the full data science pipeline.

According to the U.S. Bureau of Labor Statistics, employment of data scientists is projected to grow 34 percent from 2024 to 2034, much faster than the average for all occupations. As seen below, the salary for professionals in this field far outpaces most other degrees on campus, even others within the department. This degree will grow high earning individuals poised to give back to the ACU community.



2. Estimate total enrollment for each of the first five years.

1. Year 1 - 5
   Year 2 - 8
   Year 3 - 10
   Year 4 - 12
   Year 5 - 15
   I think we can recruit 15-20 students per year in this area - perhaps more as the field is extremely popular right now and as explained above surging in growth and outlook. The track is designed in such a way to encourage double majors and will also have a very attractive minor for a variety of majors. I think this is a conservative estimate of the degree's impact and can foresee a scenario where the demand necessitates the creation of a joint program with mathematics and computer science.

3. Name at least three other institutions whose similar programs you have reviewed.

Things every undergraduate statistics and data science program we reviewed have in common:

- Foundational mathematics. (MATH 185/186/286/325)
- A foundational computer programming course. (CS 120)
- A univariate statistics course. (MATH 377)
- A data visualization course. (MATH 387)
- Courses on data management or data wrangling/cleaning. (IT 263)
- A course focused on multivariate or regression analysis. (MATH 479)
- A capstone/project based course. (MATH 496)
- Machine learning (PHYS 453)
- Many push internships. (MATH 498)

Beyond this the level of mathematics, CS, and interdisciplinary lean of the degree varies wildly.

We have reviewed the following programs: For the purposes of comparison, our program has the following requirements.

- Math Foundation - 16 hours
- CS Foundation - 9 hours
- SDS - 28 hours
- Machine Learning - 3 hours
- Interdisciplinary Track - 18 hours / Total = 74 hours

1. Baylor University - Born out of Baylor's landmark Bioinformatics program, the Data Science degree emphasizes computer science and statistical techniques. One of the degree developers, Dr. Randy Nguyen has intimate knowledge of this program from his time at Baylor. Though Randy did graduate from the Statistics department and not the Informatics department, he took courses in both programs.
   a. They have courses in Big Data and Analytics for Machine Learning (a second semester of machine learning focused on deep learning) that we are missing, but otherwise our program compares favorably.
   b. We require Calculus III and they do not.

    c. We treat ethics and research in data science in the seminar course. I see no analogous course in their degree plan.
    d. Math - 15 hours
    e. CS - 14 hours
    f. SDS - 33 hours
    g. They require a minor or secondary major. Our interdisciplinary tracks act as an analogous requirement.
2. Arizona State University - One of the leading data science programs in the country. ASU has an extensive online presence in the data science community. We took special note of ASU's work in developing ethics courses and seminars for case studies in Data Science.
    a. Our proposal most closely resembles a mix of their program and UT's program with emphasis placed on the role of data science in society and interdisciplinary tracks.
    b. Math - 11 hours
    c. CS - 6 Hours
    d. SDS - 19 hours
    e. Interdisciplinary tracks - 20 hours
3. University of Texas - UT Austin's program is a top 30 program in the US that really focuses on business analytics. We liked their acronym SDS so we are using it to describe our Statistics and Data Science requirements.
    a. Math - 17 hours
    b. SDS - 28 hours
    c. Interdisciplinary - 12 hours
    d. CS/Business Analytics - 33 hours
    e. UT has a sports analytics course. They also have a time series forecasting course which we have elements of in our MATH 477 course.
4. Harding University - Our program proposal is far more robust and interdisciplinary than the program at Harding.
5. University of Texas at Dallas - UTD's program is intertwined with its biostatistics programs. We studied their program because they offer professional certifications and certificate programs. I think ACU Dallas would have some interest in such certificate programs.

Texas Universities offering an undergraduate degree in data science include (not an exhaustive list):

- **Austin College**
- **Baylor University**
- **Lamar University**
- **Rice University** (B.A. in Data Science)
- **Southern Methodist University (SMU)**
- **Texas A&M University** (College Station and potentially others)
- **Texas A&M Commerce**
- **Texas Christian University (TCU)**
- **Texas State University**
- **Texas Tech University**
- **Texas Woman's University**

- **Trinity University**
- **University of Houston-Downtown (UHD)** (Known for having one of the first B.S. in Data Science programs in the state)
- **University of North Texas (UNT)**
- **University of Texas at Arlington (UTA)**
- **University of Texas at Dallas (UTD)**
- **University of Texas at San Antonio (UTSA)**
- **University of Texas Rio Grande Valley (UTRGV)**

Sister schools that offer Data Science programs:

1. Harding University
2. Pepperdine University
3. Lipscomb University

The interdisciplinary nature of our proposal matches up well with Lipscomb's though they seem more focused on business analytics while our proposal gives students a choice of areas to concentrate in which includes biosciences. We outpace Harding's program in depth and breadth, and we have more statistical training proposed and a more interdisciplinary approach available than Pepperdine's program which is aligned with business mostly.

B. Curriculum description
    1. Describe the focus of this program and why it will be valuable to students.
        1. Statistics and data science are an interdisciplinary area of mathematics where mathematicians use numerical methods and algorithms to gain insight from various types of data. The student completing this degree will learn to blend statistics, computer science, and content knowledge in a given area to analyze data for patterns, make predictions and provide rationale for decision making through clear communication to key stakeholders.The major areas include data wrangling and cleaning, data visualization, and an introduction to artificial intelligence and machine learning. Students will become proficient in the use of market leading technologies in Python, SQL, R, SAS and Tableau. Heavily featured in business, healthcare, finance, engineering, computer science, research science and general decision making there is no shortage of areas in which to apply the field.

    2. Name the existing ACU programs to which it will be most similar.
        1. BS Mathematics - Actuarial Science (minimal overlap beyond the core)
        2. BS Computer Science (shares some of the foundational CS courses, but diverges after second year)
        3. Some overlap with IT, Cybersecurity online programs in COBA, but once again with substantial differences.

    3. Estimate how many new courses will be needed to deliver the program.

1. The current plan is to create three new courses MATH 387, MATH 475, and MATH 475. Replace MATH 187 with MATH 278 and add MATH 396, 496 as concurrently taught sections with MATH 397, 497 which are already taught regularly. A description of the courses involved is included below. In addition, we are proposing to take over the teaching responsibilities for BIOL 483 - Biostatistics from the biology department given our faculty expertise in the area.
    a. **MATH 278 - Computational Mathematics Lab - (0-2-1) fall, spring.** An introduction to computing with Python for science and engineering applications. Students explore calculus concepts computationally while learning core programming skills - variables, arrays, iteration, functions, recursion and plotting with SymPy, NumPy, and Matplotlib - to store, manipulate and visualize data, perform calculations, and represent mathematical functions effectively. **Prerequisite: MATH 186. Concurrent enrollment in MATH 286 recommended.**
    b. **MATH 387 - Data Visualization in R and Python (3-0-3) spring.** Introduces the basic visualization principles of modern data science using R and Python. The course addresses how to perform various exploratory data analysis (EDA) techniques, import and transform different data structures, and communicate the results. Interactive visualizations such as dashboards and animations are introduced through various projects and case studies. **Prerequisite: IS 222, MATH 123 or MATH 377.**
    c. **MATH 396 - Statistics and Data Science Seminar (2-0-2) - spring.** Examines quantitative literacy from a data and evidence driven perspective. Through class discussion and case studies, students learn the basics of ethical responsibility in the data sciences, the distinct challenges associated with modern applications of data science and appropriate methodologies for developing their own research projects. **Prerequisite: MATH 227 and completion of university communication requirement.**
    d. **MATH 475 - Sports Analytics (3-0-3) spring, odd years.** An introduction to statistical methods and consulting aimed at analyzing sports using observational data on players and teams. Study sports related problems, utilize statistical tools to find solutions and interpret those results to sports professionals. Participate in a semester-long sports analytics project in partnership with an ACU athletics team. **Prerequisite: MATH 377**

e. **MATH 479 - Multivariate Analysis (3-0-3) fall, odd years.** Introduces statistical models and procedures for describing, visualizing, and analyzing random vector response data. Generalizes classical test statistics from univariate to multivariate. Examines linear and quadratic dimension reduction, the multivariate normal distribution, inference on multivariate parameters, and supervised and unsupervised classification methods for high-dimensional data. **Prerequisite: MATH 325, MATH 377**

f. **MATH 486 - Biostatistics (3-0-3) fall, even years** Introduction to statistical concepts and methods for biological and biomedical data featuring case studies. Includes descriptive statistics, probability and distributions, estimation, exploratory methods, tests of hypotheses, error types, significance, confidence levels, sample size determination for randomized control trials, power analysis for clinical trials, categorical data, regression, correlation, and survival analysis.. **Prerequisite: IS 222, MATH 123, or MATH 377. Crosslisted with BIOL 483.**

g. **MATH 496 - Statistics and Data Science Capstone (2-0-2) fall.** Students apply the knowledge and techniques of their statistics and data science coursework to projects involving real data from students' domains of interest. Projects reflect the entire data science workflow; developing and refining questions of interest, preparing data, applying suitable analysis techniques, visualizing data, and communicating results to potential stakeholders. **Prerequisite: MATH 396. A capstone and writing-intensive course.**

C. Resource estimates

1. Number of new faculty required to deliver the program.
    1. The delivery of this new track relies mostly on the hours netted through the hiring of Dr. Randy Nguyen who was hired explicitly for this role. In replacing Mr. Smallwood, who is still adjuncting for us, we effectively picked up an additional 6 hours each semester. Those additional hours are being used to teach many of the courses in this track. Add to that the fact that Dr. Nguyen was given 3 hours of release time to help with the creation of this new track and we are looking at anywhere from 6 - 9 hours each semester being earmarked for this track. This fits the needs of the track well. Should Mr.Smallwood be unable to continue adjuncting we will probably need to secure an additional adjunct to support the department.

MATH 278 is directly replacing MATH 187 so no additional hours to teach are required there. MATH 396 and MATH 496 will meet at the same time at MATH 397 and MATH 497 and have a single course instructor so no additional hours to teach those courses are required. One change we came to after analyzing class offering patterns is MATH 377 will need to go from a Fall only course to a Fall/Spring course to accommodate the track. We will need to watch enrollment closely in this course to determine the optimal offering schedule and may have some semesters where the course is not offered if the need is too low. Luckily, we have a few options for substitution for the course if this adversely affects any students.

We have designed the offerings in such a way that there is one new to the department SDS course running in the Fall and 2 new to the department SDS courses running in the Spring each year. This is a total of 9 hours increase spread over the year. As was mentioned above, we secured that increase with the addition of Randy netting us 6 hours each semester. We have secured adjunct help for offering MATH 475 - Sports Analytics, but even if the adjunct were unavailable, offering the course every other year is still viable.

The major issue affecting our ability to comfortably teach this track is the growth of our 100 level courses through enrollment increases in COBA/nursing and our service courses for engineering needing additional sections of 200 and 300 level courses in that area. We will be unable to be flexible in the number of sections offered for certain courses and will need to waitlist students in some of our 100 level courses. This is a good problem to have and the university should support a culture of waitlisting for low level, non major courses so as to not overload those classes.

2. Describe and estimate cost of equipment needs or facility renovation.
    1. Virtually none. We already have all the existing software tools and facilities.

3. Will the program require disciplinary accreditation? Which organization?
    1. No. Program accreditation is still in the emerging stages in this field. There are professional certification programs that we would encourage our students to pursue to enhance their attractiveness in the job market.

Stop here and submit to the dean for discussion. The dean may ask for some clarification or revision. If the dean agrees, the dean should send the proposal to the vice provost. Continue with Step 2 after the vice provost approves the proposal to advance. Adjust responses in the Step 1 section as requested by the vice provost.

This proposal

☑ should
☐ should not
advance for further consideration.

01/28/2026

Dean Date

Comments: This a great program for the Math Department and ACU to pursue. I fully support it.

This proposal
☑ should
☐ should not
advance for further consideration.

Wes Crawford (Jan 28, 2026 11:56:00 CST)

01/28/2026

Vice Provost Date

Comments:

This looks great, John. I'll have Jessica Smith send you the market analysis you will need for step #2. Please proceed onto step #2 now.

Step 2: Full Proposal Information

3. Program Information
    A. Program description. This 50- to 200-word explanation will be included in the catalog with a degree plan.

Statistics and data science are an interdisciplinary area of mathematics where mathematicians use numerical methods and algorithms to gain insight from various types of data. The student completing this degree will learn to blend statistics, computer science, and content knowledge in a given area to analyze data for patterns, make predictions and provide rationale for decision making through clear communication to key stakeholders.The major areas include data wrangling and cleaning, data visualization, and an introduction to artificial intelligence and machine learning. Students will become proficient in the use of market leading technologies in Python, SQL, R, SAS and Tableau. Heavily featured in business, healthcare, finance, engineering, computer science, research science and general decision making there is no shortage of areas in which to apply the field.

    B. Program mission statement. It should define what students will be equipped to do upon completion of the program.

The data science and statistics program at Abilene Christian University equips students to be technically excellent and ethically considerate stewards of data and information. Informed by Christian principles, we equip students with the analytical and technical skills needed to use data to seek truth and serve our communities.

    C. Student learning outcomes. Define the competencies for graduates of your program. They should be specific and measurable. You should have a minimum of three and no more than seven.

SDS-1: Foundational Knowledge

A. Foundational Knowledge: College Algebra, Precalculus, Calculus and Differential Equations
    a. Students use algebra, trigonometry, and calculus to solve problems and can explain the relationships between fundamental calculus concepts of limit, continuity, derivative, and definite integral.
B. Foundational Knowledge: Algebraic Structures
    a. Students use and prove properties of groups, rings, and fields and can describe the relationships between objects and their sub-objects. Students also use matrices and matrix algebra to solve systems of linear equations, to understand the geometry of Euclidean n-space, and to describe the relationship between systems of linear equations, matrices, determinants, vectors, linear transformations, and eigenvalues.
C. Foundational Knowledge: Statistics and Probability

    a. Students analyze data using commonly used statistical methodologies; have a rational understanding of the concepts of variability, uncertainty, randomness, and inference; and have the evidentiary thinking and critical reasoning skills necessary to evaluate data and information and to apply numerical concepts in real-life situations.

D. Foundational Knowledge: Discrete Structures
    a. Students apply properties of relations, graphs, trees, functions, sequences and series to complete operations on discrete structures.

E. Foundational Knowledge: Programming
    a. Students learn industry leading programming languages in R and Python and their application to solving problems in mathematics.

SDS-2: Data Skills

A. Data Skills: Data Cleaning and Wrangling
    a. Students will transform raw inconsistent data into a tidy, structured format suitable for analysis.

B. Data Skills: Exploratory Data Analysis
    a. Students articulate meaningful lines of inquiry and generate hypotheses based on statistical analysis and observed data trends.

C. Data Skills: Data Visualization
    a. Students will tailor visualizations, using industry-standard software and programming languages, to the needs of the target audience.

D. Data Skills: Data Ethics
    a. Students will identify ethical issues in data-driven decision-making and apply moral frameworks to resolve them.

SDS-3: Model Formulation

A. Model Formulation: Model Selection and Validation
    a. Students will be able to select and justify the most appropriate statistical or machine learning models based on data characteristics.

B. Model Formulation: Supervised Learning
    a. Students will be able to build models that map input-output relationships using labeled datasets.

C. Model Formulation: Unsupervised Learning
    a. Students will demonstrate the ability to discover intrinsic patterns, structures, or groupings within unlabeled data.

D. Model Formulation: Reinforcement Learning
    a. Students will design intelligent agents that learn optimal behaviour through trial-and-error interactions with an environment.

SDS-4: Vocation

A. Vocational: Collaboration and Consultation
    a. Students will demonstrate the ability to collaborate with stakeholders to identify problems, analyze data, and communicate recommendations effectively through written and oral reports.
B. Vocational: Life-long Learning
    a. Students will demonstrate the ability to identify, locate, and evaluate new information to solve unfamiliar problems and adapt new technologies or methodologies within their field.
C. Vocational: Communication
    a. Students will explain specialized mathematical or statistical concepts clearly in oral, graphical, and written forms in a way that is accessible to non-expert audiences.
D. Vocational: Internships
    a. Students will participate in internship experiences to expand technical skills and professional networking gaining confidence in industry-specific practices.
E. Vocational: Certification and External Assessment
    a. Students will complete professional certifications or external assessments focused on demonstrating specialized, industry-verified skills and knowledge, resulting in enhanced employability.

D. Admission requirements. Describe prerequisites, which may include items such as application to the major, test scores, GPA, courses, skills, academic standing, etc.

Data science requires a strong high school preparation in mathematics and computer science. A minimum of elementary algebra and geometry should be completed, while trigonometry and calculus are highly recommended. Any Advanced Placement courses in computer science, mathematics or statistics are highly beneficial. Foundational knowledge in programming is standard and will feature heavily in the first two years of the program. We do not plan for any specific admissions requirements, at this time, beyond university admission.

E. CIP code. Identify the 6-digit CIP code for the program. This is the system by which the government classifies all postsecondary educational programs.

Detail for CIP Code 30.7001

Title: Data Science, General.

Definition: A program that focuses on the analysis of large scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in

computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.

4. Rationale and Need for Program
   A. Mission fit. How does the program fit with the university's mission to educate students for Christian service and leadership throughout the world? How does the program fit with the university's current strategic plan or emphases?

      It's hard to think of a degree on campus that has a better combination of market need and program fit. The program outcomes directly align with the university's status as an R2 and bolster the new Nuclear Science and NeXT lab initiatives. The program could also serve as a center piece for aiding in research growth across campus. Accordingly, the new courses developed to launch this degree have wide applicability to other departments on campus that seek to raise the data analytics and quantitative skills of their majors. Indeed, several departments have already inquired about adding our new courses like MATH 378 - Data Visualization in R and Python to their degrees.

      There are not many areas of our world that data doesn't touch. Increasingly, more decisions are data based and we face an ever increasing surge of technological advancement riding the wave of advances in machine learning, deep learning, and artificial intelligence. ACU should seek to build graduates that have a strong ethical foundation to speak into these areas. We should produce graduates capable of not only analyzing data for the benefit of humanity, but have the ethical framework to do so responsibly and call out those who use these tools irresponsibly, unethically, or with veiled intent.

      The degree itself is vital to a campus culture that wishes to be more research oriented. At most universities statisticians and data scientists are responsible for collaboration on a variety of interdisciplinary projects campus wide. They teach and collaborate with other faculty, allowing those faculty access to the necessary skills to enhance their own research. Not to mention, the students generated from this program raise the level of undergraduate research for all programs that intersect with this one. As ACU's strategic plan involves the attainment and maintaining of R2 status, ACU must seriously consider the level (or lack thereof) of quantitative infrastructure to make such a status viable. This degree plays a pivotal role in strengthening that infrastructure and could be used to support multiple graduate level programs (and undergraduate) in need of elevating data related outcomes.

   B. Employment demand and career possibilities.
      1. Identify jobs that graduates would be qualified to pursue.

      Students interested in this program include any student interested in science from a computational perspective. It has tremendous appeal to the areas of

business, computer science and healthcare.

Upon graduation, students completing this degree will be sought after by healthcare companies, insurance companies, banking and financial services, government, aerospace and defense contractors, higher education, telecommunications, sports, corporate research and operations teams, etc.. Most of the jobs will ask graduates to do the same basic tasks of data wrangling, data management and analysis, while some will demand higher level skills involving algorithm creation, or deliverables across the full data science pipeline.

2. Use official databases to establish the job market for graduates of the program. Use the U.S. Bureau of Labor Statistics and Texas Workforce Commission; other sources that may be helpful are authorities on regional labor markets (e.g., metropolitan Chambers of Commerce) and current industry reports.

    1) Employment of data scientists is expected to grow 34 percent from 2024 to 2034, much faster than the average for all occupations. About 23,400 job openings are projected each year, on average, over the decade. (US Bureau of Labor Statistics)
    2) Employment of statisticians is expected to grow 8 percent from 2024 to 2034, much faster than the average for all occupations. About 2,200 job openings for statisticians are projected each year, on average, over the decade. (US Bureau of Labor Statistics)
    3) Currently there are about 4,944 data scientists employed in the state of Texas. By 2032 this number is expected to reach 8007, a 62% increase. The 2024 OEWS annual median wage is $102,408. Professional, scientific and technical services industry experienced the fastest growing share of Texas employment in 2025 and now accounts for 7.6% of all Texas employment, making it the state's fifth largest industry. (Texas Workforce Commission - Report on Texas Growth Occupations - 2025)

3. Use the crosswalk document provided by IPEDS to take your previously identified CIP code and find the associated occupations in the Standard Occupational Classification system provided by the Bureau of Labor Statistics. Use the associated SOC number to find entry-level and mean wages in that field in Texas from the Texas Workforce Commission (Texas Wages — Wages by Workforce Development Area).

SOC #	Job	Wages
11-3021	Computer and Information Systems Managers	174854.00
11-9121	Natural Sciences Managers	136949.00
15-1221	Computer and Information Research Scientists	115883.00

15-1243	Database Architects	136926.00
15-1252	Software Developers	133282.00
15-2041	Statisticians	110911.00
15-2051	Data Scientists	114802.00
25-1199	Postsecondary Teachers, All Other	83899.00
13-1111	Management Analysts	107549.00
15-1251	Computer Programmers	91560.00
13-1161	Market Research Analysts and Marketing Specialists	75214.00
11-3031	Financial Managers	172530.00
13-1111	Management Analysts	107549.00
13-2051	Financial and Investment Analysts	102873.00
15-0000	Computer and Mathematical Occupations	110423.00
15-2099	Mathematical Science Occupations, All Other	93940.00

Source 2018-2020 CIP SOC Crosswalk

3. Prospective student interest. Share any data from your discipline that shows student demand for the program. Is the program likely to draw students who are already at ACU, or will it draw new students to the university? Whom should we recruit, and with whom will we compete for students?

   Students interested in this program include any student interested in science from a computational perspective. It has tremendous appeal to the areas of business, computer science and healthcare. For these reasons, our track is designed to encourage interdisciplinary exploration in these areas. I also suspect a large number of mathematics students will declare this track as well.

   - The area is becoming increasingly recognized by the math community. Over the past two years, the Mathematical Association of America has had two projects taking shape. One of these was to produce a special issue of the Monthly devoted to data science. The other was the development of a new journal whose content would highlight all the ways mathematicians can intersect with data science: teaching, research and applications. This new journal, Scatterplot, has just published Volume 1.
   - Data science educational opportunities for students are rapidly growing. Universities, colleges, community colleges, and other organizations are starting to offer a range of programs for students with different interests and backgrounds. This chapter provides an overview of the current

landscape of classes and programs and identifies some of the key challenges facing those who aim to develop a data science program. (From NIH https://www.ncbi.nlm.nih.gov/books/NBK532765/)

- Data science programs have the potential to attract broad participation, including diverse members from different disciplines (including the humanities, social sciences, and the arts) and from populations that are underrepresented in other similar science, technology, engineering, and mathematics (STEM) fields (see Box 4.1). Part of this potential comes from the various compelling application areas of data science, including digital humanities, computational social science, public policy, and many others. There are also numerous skill sets that are currently captured under a data scientist label that span multiple training and education levels. (National Academies of Sciences, Engineering, and Medicine. 2018. Envisioning the Data Science Discipline: The Undergraduate Perspective: Interim Report. Washington, DC: The National Academies Press. https://doi.org/10.17226/6478.)

4. Disciplinary benchmarking. Use the benchmark schools that you named in 2.A.3 to respond, plus any other programs you have reviewed. How does this program curriculum compare to other programs in your discipline? Which Texas universities already offer this program? You may also note other peer institutions that offer the program.

   Things every undergraduate statistics and data science program have in common:
   - Foundational mathematics. (MATH 185/186/286/325)
   - A foundational computer programming course. (CS 120)
   - A univariate statistics course. (MATH 377)
   - A data visualization course. (SDS 387)
   - Courses on data management or data wrangling/cleaning. (IT 263)
   - A course focused on multivariate or regression analysis. (SDS 479)
   - A capstone/project based course. (SDS 496)
   - Machine learning (PHYS 453)
   - Many push internships. (MATH 498)

   Beyond this the level of mathematics, CS, and interdisciplinary lean of the degree varies wildly.

   We have reviewed the following programs: For the purposes of comparison, our program has the following requirements.
   - Math Foundation - 16 hours
   - CS Foundation - 9 hours
   - SDS - 28 hours
   - Machine Learning - 3 hours
   - Interdisciplinary Track - 18 hours / Total = 74 hours

   1. Baylor University - Born out of Baylor's landmark Bioinformatics program, the Data Science degree emphasizes computer science and statistical techniques. One of the degree developers, Dr. Randy Nguyen has

intimate knowledge of this program from his time at Baylor. Though Randy did graduate from the Statistics department and not the Informatics department, he took courses in both programs.
    a. They have courses in Big Data and Analytics for Machine Learning (a second semester of machine learning focused on deep learning) that we are missing, but otherwise our program compares favorably.
    b. We require Calculus III and they do not.
    c. We treat ethics and research in data science in the seminar course. I see no analogous course in their degree plan.
    d. Math - 15 hours
    e. CS - 14 hours
    f. SDS - 33 hours
    g. They require a minor or secondary major. Our interdisciplinary tracks act as an analogous requirement.
2. Arizona State University - One of the leading data science programs in the country. ASU has an extensive online presence in the data science community. We took special note of ASU's work in developing ethics courses and seminars for case studies in Data Science.
    a. Our proposal most closely resembles a mix of their program and UT's program with emphasis placed on the role of data science in society and interdisciplinary tracks.
    b. Math - 11 hours
    c. CS - 6 Hours
    d. SDS - 19 hours
    e. Interdisciplinary tracks - 20 hours
3. University of Texas - UT Austin's program is a top 30 program in the US that really focuses on business analytics. We liked their acronym SDS so we are using it to describe our Statistics and Data Science requirements.
    a. Math - 17 hours
    b. SDS - 28 hours
    c. Interdisciplinary - 12 hours
    d. CS/Business Analytics - 33 hours
    e. UT has a sports analytics course. They also have a time series forecasting course which we have elements of in our MATH 477 course.
4. Harding University - Our program proposal is far more robust and interdisciplinary than the program at Harding.
5. University of Texas at Dallas - UTD's program is intertwined with its biostatistics programs. We studied their program because they offer professional certifications and certificate programs. I think ACU Dallas would have some interest in such certificate programs.

Texas Universities offering an undergraduate degree in data science include (not an exhaustive list):

- **Austin College**
- **Baylor University**
- **Lamar University**
- **Rice University** (B.A. in Data Science)

- **Southern Methodist University (SMU)**
- **Texas A&M University** (College Station and potentially others)
- **Texas A&M Commerce**
- **Texas Christian University (TCU)**
- **Texas State University**
- **Texas Tech University**
- **Texas Woman's University**
- **Trinity University**
- **University of Houston-Downtown (UHD)** (Known for having one of the first B.S. in Data Science programs in the state)
- **University of North Texas (UNT)**
- **University of Texas at Arlington (UTA)**
- **University of Texas at Dallas (UTD)**
- **University of Texas at San Antonio (UTSA)**
- **University of Texas Rio Grande Valley (UTRGV)**

Sister schools that offer Data Science programs:

1. Harding University
2. Pepperdine University
3. Lipscomb University

The interdisciplinary nature of our proposal matches up well with Lipscomb's though they seem more focused on business analytics while our proposal gives students a choice of areas to concentrate in which includes biosciences. We outpace Harding's program in depth and breadth, and we have more statistical training proposed and a more interdisciplinary approach available than Pepperdine's program which is aligned with business mostly.

5. Curriculum
   A. Degree plan. List the major requirements as they would appear in the catalog. For undergraduate degree plans, include 74 credit hours of major requirements and electives, and mark which courses are the capstone and writing-intensive courses. A master's degree must have a minimum of 30 credit hours. A doctoral degree must have a minimum of 30 hours beyond the master's degree.

General Education Requirements

Please see the General Education section of this catalog.

Major Requirements

SDS Core

MATH 101 - Introduction to the Math Major Credit Hours: 2
MATH 185 - Calculus I Credit Hours: 3 *
MATH 186 - Calculus II Credit Hours: 3
MATH 227 - Discrete Mathematics Credit Hours: 3
MATH 278 - Computational Mathematics Laboratory Credit Hours: 1
MATH 286 - Calculus III Credit Hours: 3
MATH 325 - Linear Algebra Credit Hours: 3
MATH 377 - Statistical Methods I Credit Hours: 3
SDS 387 - Data Visualization in R and Python Credit Hours: 3
SDS 396 - SDS Seminar Credit Hours: 2
MATH 477 - Statistical Methods II Credit Hours: 3
SDS 479 - Multivariate Analysis Credit Hours: 3
SDS 496 - SDS Capstone Credit Hours: 2

*Hours may also fulfill general education requirements and are not included in total major hours.

Total: 31 Credit Hours

Supplement for Major

Computer Science and Business

- CS 120 - Programming I Credit Hours 3
- CS 130 - Programming II Credit Hours 3
- IT 220 - Introduction to Databases and Database Management Systems Credit Hours: 3
- IT 263 - Analytics 2: Data Management Credit Hours: 3
- IS 432 - Analytics 3: Data Mining Credit Hours: 3

Engineering and Physics

- PHYS 453 - Machine Learning Credit Hours: 3

Total: 18 Credit Hours

Tracks for Major

Computer Science and Business Analytics Track

Students must complete the following courses:

- CS 332 - Design and Analysis of Algorithms
- CS 341 - Numerical Methods
- CS 467 - Introduction to Artificial Intelligence
- Choose 9 hours from the following:
    - CS 230 - Object-Oriented Programming
    - CS 352 - Programming Languages
    - CS 365 - Theory of Computation

    - IS 324 - Management Information Systems
    - IS 405 - Systems Analysis and Design
    - IS 442 - Analytics 4: Business Analytics Projects
    - IT 221 - Fundamentals of Networking and Data Communications
    - IT 310 - Introduction to Computer and Information Security
    - MATH 498 - Mathematics Internship

Biosciences Track

Students must complete the following courses:

- BIOL 121 - Introductory Biology I *
- BIOL 122 - Introductory Biology I Laboratory
- BIOL 123 - Introductory Biology II *
- BIOL 124 - Introductory Biology II Laboratory
- CHEM 133 - General Chemistry I
- CHEM 131 - General Chemistry Laboratory I
- BIOL 312 - Cell Biology
- Choose 9 hours from the following:
    - BIOL 351 - Genetics
    - BIOL 352 - Genetics Laboratory
    - BIOL 355 - Microbiology
    - BIOL 357 - Microbiology Laboratory
    - BIOL 452 - Virology
    - BIOL 454 - Immunology
    - BIOL 475 - Molecular Genetics
    - BIOL 476 - Biotechnology
    - SDS 486 - Biostatistics
    - BIOL 498 - Cancer Biology
    - MATH 498 - Mathematics Internship

*Six hours may also fulfill general education requirements and are not included in total major hours.

Mathematics Track

Students must complete the following courses:

- MATH 341 - Numerical Methods
- SDS 475 - Sports Analytics
- SDS 478 - Mathematical Statistics
- Choose 9 hours from the following:
    - MATH 351 - Abstract Algebra
    - MATH 361 - Ordinary Differential Equations
    - MATH 371 - Combinatorics and Graph Theory
    - MATH 381 - Analysis I
    - MATH 453 - Abstract Algebra II
    - MATH 463 - Partial Differential Equations
    - MATH 473 - Complex Analysis
    - SDS 486 - Biostatistics
    - MATH 498 - Mathematics Internship

Total: 18 Credit Hours

Electives

Minimum - 7 Credit Hours

Total Major Hours: 74

Other Graduation Requirements

Minimum GPA in major requirements and supplement: 2.50
Minimum GPA for graduation: 2.00
Minimum advanced hours: 33
Minimum total hours: 128

*Courses numbered 0** do not count in minimum hours required for a degree.*

B. Course coordination. Attach a memo or email of support from the department chair of each department outside the home department that will provide a course for the program.

Attached in email are letters of support from:

- ☐ Physics (in support of Python curriculum and Machine Learning)
- ☐ Biology (in support of Biostatistics and Biosciences concentrations)
- ☐ Computer Science and Business (in support of programming classes and CS and Business concentrations)

C. Courses. Create a table with one row for every course, existing and new, included in the program/major requirements. Create five columns that provide the following information:
    1. Rotation and frequency (e.g., fall odd years)
    2. Whether the course is required or on a menu
    3. Which track(s) the course serves, if applicable
    4. Current faculty credentialed to teach (everyone who is eligible to teach the course, not just who *will* teach the course)

Courses (New Courses Highlighted in Yellow, Courses Changed Due to Proposal Highlighted in Orange)	**Rotation/ Frequency**	**Require?**	**Tracks Served**	**Credentialed Faculty**
MATH 101 - Introduction to the Math Major	Fall	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	All in MATH
MATH 185 - Calculus I	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov Heather Makarewicz
MATH 186 - Calculus II	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov Heather Makarewicz
MATH 227 - Discrete Mathematics	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov

MATH 278 - Computational Mathematics Lab (replacing MATH 187)	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang
MATH 286 - Calculus III	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 325 - Linear Algebra	Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 351 - Abstract Algebra	Fall, even	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 361 - Ordinary Differential Equations	Fall / Spring	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 371 - Combinatorics and Graph Theory	Fall, odd	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
SDS 377 - Statistical Methods I	Fall / Spring	Yes	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang

SDS 378 - Data Visualization in R and Python	Spring	Yes	BS MATH BS MASC BA MATH-APP BS SDS	John Ehrke Randy Nguyen Hana Jang
MATH 381 - Analysis I	Fall, odd	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
SDS 396 - Statistics and Data Science Seminar	Spring Meets together with MATH 397, taught by one instructor.	Yes	BS SDS	John Ehrke Randy Nguyen David Hendricks Jordan Broussard Hana Jang
MATH 453 - Abstract Algebra II	Spring, odd	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 463 - Partial Differential Equations	Spring	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
MATH 473 - Complex Analysis	Spring, even	Menu	BS MATH BS MASC BS MATT BA MATH-APP BA MATH-PURE BS SDS	David Hendricks Randy Nguyen John Ehrke Jordan Broussard Hana Jang Alexander Karabegov
SDS 475 - Sports Analytics	Spring, odd	Menu	BS MATH BS MASC BA MATH-APP BS SDS	John Ehrke Randy Nguyen Austin Basye (adjunct)
MATH 477 - Statistical Methods II	Spring, even	Yes	BS MSDS BS MASC	David Hendricks Randy Nguyen

			BA MATH-APP BS SDS	John Ehrke Jordan Broussard Hana Jang
MATH 478 - Mathematical Statistics	Spring, odd	Menu	BS MASC BS SDS	David Hendricks Randy Nguyen John Ehrke
SDS 479 - Multivariate Analysis	Fall, odd	Yes	BS MATH BS MASC BA MATH-APP BS SDS	John Ehrke Randy Nguyen David Hendricks
SDS 486 - Biostatistics	Fall, even	Menu	BS MATH BS MASC BA MATH-APP BS SDS	John Ehrke Randy Nguyen David Hendricks Josh Brokaw
SDS 496 - Statistics and Data Science Capstone	Fall Meets together with MATH 497, taught by one instructor.	Yes	BS SDS	John Ehrke Randy Nguyen David Hendricks Jordan Broussard Hana Jang
MATH 498 - Mathematical Internship	Fall, Spring	Menu	BS MATH BS MASC BA MATH-APP BA MATH-PURE BS SDS	John Ehrke Randy Nguyen David Hendricks Jordan Broussard Hana Jang
CS 120 - Programming I	Fall / Spring	Yes	BS MATH BS MASC BS SDS	
CS 130 - Programming II	Fall / Spring	Yes	BS MATH BS MASC BS SDS	
CS 230 - Object-Oriented Programming	Spring	Menu	BS SDS	
CS 332 - Design and Analysis of Algorithms	Fall	Menu	BS SDS	

CS 341 - Numerical Methods	Fall, even	Menu	BS MATH BA MATH-APP BS SDS	John Ehrke David Hendricks Randy Nguyen Hana Jang Jordan Broussard
CS 352 - Programming Languages	Fall	Menu	BS SDS	
CS 365 - Theory of Computation	Spring	Menu	BS SDS	
CS 467 - Introduction to Artificial Intelligence	Spring	Menu	BS SDS	
IS 324 - Management Information Systems	Fall, Spring	Menu	BS SDS	
IS 405 - Systems Analysis and Design	Spring	Menu	BS SDS	
IS 432 - Analytics 3: Data Mining	Fall, Spring	Yes	BS SDS	
IS 442 - Analytics 4: Business Analytics Projects	Spring	Menu	BS SDS	
IT 220 - Introduction to Databases and Database Management Systems	Fall	Yes	BS SDS	
IT 221 - Fundamentals of Networking and Data Communications	Spring	Menu	BS SDS	
IT 263 - Analytics 2: Data Management	Fall, Spring	Yes	BS SDS	
IT 310 - Introduction to Computer and Information Security	Fall	Menu	BS SDS	
BIOL 121/122 - Introductory Biology I	Fall / Spring	Menu	BS SDS	

BIOL 123/124 - Introductory Biology II	Fall / Spring	Menu	BS SDS	
CHEM 133/134 - General Chemistry I	Fall / Spring	Menu	BS SDS	
BIOL 312 - Cell Biology	Fall / Spring	Menu	BS SDS	
BIOL 351/352 - Genetics	Spring	Menu	BS SDS	
BIOL 355/357 - Microbiology	Fall / Spring	Menu	BS SDS	
BIOL 452 - Virology	Fall, even	Menu	BS SDS	
BIOL 454 - Immunology	Fall	Menu	BS SDS	
BIOL 475 - Molecular Genetics	Spring	Menu	BS SDS	
BIOL 476 - Biotechnology	Spring	Menu	BS SDS	
BIOL 498 - Cancer Biology	Fall	Menu	BS SDS	
PHYS 453 - Machine Learning	Spring, even	Yes	BS SDS	Michael Daugherity Robert Brown Larry Isenhower Joseph Atchison Randy Nguyen John Ehrke

D. New courses. For each new course included in the program requirements, list the following information. The vice provost will insert a curriculum approval schedule to set deadlines for introducing each new course.
    1. Proposed subject code and course number
    2. Course title and description
    3. Existing programs in which the courses will also be used, if applicable (see highlighted yellow rows in table above)

Note: We have attached sample four year plans for even and odd years to this proposal in the email.

MATH 278 - Computational Mathematics Lab - (0-2-1) Fall, spring.
An introduction to computing with Python for science and engineering applications. Students explore calculus concepts computationally while learning core programming skills - variables, arrays, iteration, functions, recursion and plotting with SymPy, NumPy, and Matplotlib - to store,

manipulate and visualize data, perform calculations, and represent mathematical functions effectively. **Prerequisite: MATH 186. Concurrent enrollment in MATH 286 recommended.**

MATH 377 - Statistical Methods I (3-0-3) Fall, spring.
Measurement concepts and scales, populations versus samples, descriptive statistics, random variables and their properties, sampling processes and distributions, special probability distributions, confidence intervals on means and variances from samples, hypothesis tests, one-way analysis of variance, linear correlation and regression, estimation of proportions, and introduction to contingency tables. **Prerequisite: MATH 131 or MATH 185.**

SDS 387 - Data Visualization in R and Python (3-0-3) Spring.
Introduces the basic visualization principles of modern data science using R and Python. The course addresses how to perform various exploratory data analysis (EDA) techniques, import and transform different data structures, and communicate the results. Interactive visualizations such as dashboards and animations are introduced through various projects and case studies. **Prerequisite: IS 222, MATH 123 or MATH 377.**

SDS 396 - Statistics and Data Science Seminar (2-0-2) Spring.
Examines quantitative literacy from a data and evidence driven perspective. Through class discussion and case studies, students learn the basics of ethical responsibility in the data sciences, the distinct challenges associated with modern applications of data science and appropriate methodologies for developing their own research projects. **Prerequisite: MATH 227 and completion of university communication requirement.**

SDS 475 - Sports Analytics (3-0-3) Spring, odd years.
An introduction to statistical methods and consulting aimed at analyzing sports using observational data on players and teams. Study sports related problems, utilize statistical tools to find solutions and interpret those results to sports professionals. Participate in a semester-long sports analytics project in partnership with an ACU athletics team. **Prerequisite: MATH 377.**

MATH 477 - Statistical Methods II - (3-2-3) Spring, even years.
Experimental design and analysis of variance, multiple regression analysis, analysis of covariance, time-series analysis, nonparametric methods, and extended concepts of categorical data analysis, including logistic regression and log-linear models. Includes an introduction to contemporary statistical software. Laboratory graded and credited with course and contains lecture with software instruction. **Prerequisite: MATH 377.**

SDS 479 - Multivariate Analysis (3-0-3) Fall, odd years.
Introduces statistical models and procedures for describing, visualizing, and analyzing random vector response data. Generalizes classical test statistics from univariate to multivariate. Examines linear and quadratic dimension reduction, the multivariate normal distribution, inference on multivariate parameters, and supervised and unsupervised classification methods for high-dimensional data. **Prerequisite: MATH 325, MATH 377.**

SDS 486 - Biostatistics (3-0-3) Fall, even years.
Introduction to statistical concepts and methods for biological and biomedical data featuring case studies. Includes descriptive statistics, probability and distributions, estimation, exploratory methods, tests of hypotheses, error types, significance, confidence levels, sample size determination for randomized control trials, power analysis for clinical trials, categorical data, regression, correlation, and survival analysis. **Prerequisite: IS 222, MATH 123 or MATH 377. Same as BIOL 483.**

SDS 496 - Statistics and Data Science Capstone (2-0-2) Fall.
Students apply the knowledge and techniques of their statistics and data science coursework to projects involving real data from students' domains of interest. Projects reflect the entire data science workflow; developing and refining questions of interest, preparing data, applying suitable analysis techniques, visualizing data, and communicating results to potential stakeholders. **Prerequisite: MATH 396.**

6. Assessment Plan
    A. Curriculum map. Prepare a table that lists all required courses in the degree plan and program outcomes. Identify the program outcomes that each course supports and mark whether the course addresses the program outcome at an introductory, reinforcing, or advanced level (see example).

Note: We have linked to the assessment spreadsheet for this year where we have added a spreadsheet for this program. All courses serving the program have been marked as required. The full curriculum map is attached at the end of the file.
SDS Program Outcomes - Curriculum Map

The four program outcomes for SDS are as follows:

1. **Foundational Knowledge** - Students will acquire foundational knowledge in areas of calculus, algebra, discrete structures, statistics and probability, and programming to work with data and bridge the gap between theory and practical application.
2. **Data Skills** - Students will demonstrate proficiency in data related skills, including data cleaning and wrangling, exploratory data analysis, data visualization and data ethics.
3. **Model Formulation** - Students will compare, contrast, and evaluate competing models and simulation techniques including an understanding of overfitting, underfitting, training vs. testing, and cross-validation.
4. **Vocational Skills** - Students identify and cultivate vocational skills within specific industries to communicate complex insights to non-technical stakeholders.

B. Outcome assessment measures. For each program outcome (in sections 3.C and 6.A)., identify *at least* two measures. These may be course-embedded components (e.g., assignments, projects, exams) or other measures, such as pre- and post-tests, external certification or licensure, portfolio assessment, standardized exams, research presentation, juries, etc. You should be able to

collect each measure every year unless the course is offered less frequently. Each measure will include:

1. Description of the artifact to be assessed.
2. Competency target. This is the minimum acceptable target (e.g., 80% of students will demonstrate competency; 75% of students will earn a C or higher) that defines success.
3. Ideal target. This may be a slightly higher standard or a greater percentage of student success (e.g., 90% of students will demonstrate competency; 75% of students will earn a B or higher). Be realistic; universal success is unlikely.
4. Name of the person responsible for measuring the outcome.
5. Timeline. When will you measure the outcome? This may happen every time the class is taught, during a particular semester (e.g. annually in fall), or on a regular basis (e.g., every other year).

Outcome 1- Foundational Knowledge

Measure 1

Artifact: Final exam “anchor” problems in Cal 1, Cal 2, Cal 3 to be given on Cal 3 final exam which is comprehensive over the full sequence.
Competency Target: 70% of students score 75% or higher.
Ideal Target: 80% of students score 75% or higher.
Person Responsible: John Ehrke and Cal 3 instructor.
Measurement Timeline: Every semester.

Measure 2

Artifact: A standardized technical assessment in the sophomore year to evaluate a student’s ability to convert a mathematical formula into a Python/R script.
Competency Target: 70% of students complete a functioning script.
Ideal Target: 80% of students complete a functioning script.
Person Responsible: John Ehrke and MATH 278 instructor.
Measurement Timeline: Every semester.

Outcome 2 - Data Skills

Measure 1

Artifact: Capstone senior project will contain a rubric that scores students on data cleaning, data wrangling and exploratory data analysis.
Competency Target: 70% of students score a 3 out of 5 or higher on the model formulation part of the capstone project rubric.
Ideal Target: 70% of students score a 4 out of 5 or higher on the model formulation part of the capstone project rubric.
Person Responsible: John Ehrke and capstone instructor.
Measurement Timeline: Every Fall during the Capstone course.

Measure 2

Artifact: A review of a student-curated portfolio containing three distinct visualizations to be turned in at the end of the MATH 387 course.
Competency Target: 70% of students complete a portfolio at the 3 out of 5 or higher standard.

Ideal Target: 70% of students complete a portfolio at the 4 out of 5 or higher standard.
Person Responsible: John Ehrke and MATH 387 instructor (almost always Randy Nguyen).
Measurement Timeline: Every Spring during 387.

Outcome 3 - Model Formulation

Measure 1

Artifact: A lab assignment where students document why they chose a specific model over an alternative, specifically citing metrics like R^2, RMSE, or F1-score.
Competency Target: 70% of students score 75% or higher.
Ideal Target: 80% of students score 75% or higher.
Person Responsible: John Ehrke and MATH 377/477/479 instructor.
Measurement Timeline: Every time one of the aforementioned courses is taught.

Measure 2

Artifact: Capstone thesis paper will focus on discussing their ability to justify model complexity and validity in a technical manner.
Competency Target: 70% of students score a 3 out of 5 or higher on the model formulation component of the Capstone paper rubric.
Ideal Target: 70% of students score a 4 out of 5 or higher on the model formulation component of the Capstone paper rubric.
Person Responsible: John Ehrke and Capstone instructor (almost always Randy Nguyen).
Measurement Timeline: Every Fall during Capstone.

Outcome 4 - Vocation

Measure 1

Artifact: Student involvement with internship, REU, undergraduate Research, professional certification or consultation experiences.
Competency Target: 100% of students will engage in at least one of the vocational experiences above.
Ideal Target: 100% of students will engage in at least two of the vocational experiences above.
Person Responsible: John Ehrke and Randy Nguyen
Measurement Timeline: Every year tallied at the end of the year and kept in a department spreadsheet.

Measure 2

Artifact: Capstone presentation.
Competency Target: Average score of 4 out of 5 across all reviewers according to the professional presentation rubric.
Ideal Target: Average score of 4.3 out of 5 across all reviewers according to the professional presentation rubric.
Person Responsible: John Ehrke and Capstone instructor (almost always Randy Nguyen).
Measurement Timeline: Every Fall during Capstone.

7. Required Institutional Support
    A. Faculty requirements and availability.
        1. Describe the new program's impact on faculty workload. Your narrative should provide supporting evidence that the number of full-time faculty members will be adequate to support the program.

- The delivery of this new track relies mostly on the hours netted through the hiring of Dr. Randy Nguyen who was hired explicitly for this role. In replacing Mr. Smallwood, who is still adjuncting for us, we effectively picked up an additional 6 hours each semester. Those additional hours are being used to teach many of the courses in this track. Add to that the fact that Dr. Nguyen was given 3 hours of release time to help with the creation of this new track and we are looking at anywhere from 6 - 9 hours each semester being earmarked for this track. This fits the needs of the track well. Should Mr.Smallwood be unable to continue adjuncting we will probably need to secure an additional adjunct to support the department.

  MATH 278 is directly replacing MATH 187 so no additional hours to teach are required there. SDS 396 and SDS 496 will meet at the same time at MATH 397 and MATH 497 and have a single course instructor so no additional hours to teach those courses are required. One change we came to after analyzing class offering patterns is MATH 377 will need to go from a Fall only course to a Fall/Spring course to accommodate the track. We will need to watch enrollment closely in this course to determine the optimal offering schedule and may have some semesters where the course is not offered if the need is too low. Luckily, we have a few options for substitution for the course if this adversely affects any students.

  We have designed the offerings in such a way that there is one new to the department SDS course running in the Fall and 2 new to the department SDS courses running in the Spring each year. This is a total of 9 hours increase spread over the year. As was mentioned above, we secured that increase with the addition of Randy netting us 6 hours each semester. We have secured adjunct help for offering SDS 475 - Sports Analytics, but even if the adjunct were unavailable, offering the course every other year is still viable.

  The major issue affecting our ability to comfortably teach this track is the growth of our 100 level courses through enrollment increases in COBA/nursing and our service courses for engineering. We will be unable to be flexible in the number of sections offered for certain courses and will need to waitlist students in some of our 100 level courses. This is a good problem to have and the university should support a culture of waitlisting for low level, non major courses so as to not overload those classes.

        2. If program delivery requires a faculty hire, provide an expected salary range and forecast potential faculty availability.

- Long term, if the program is successful, we would be asking for an additional hire to ease enrollment pressures across the board, but we are not seeking that at this moment.

  In the future, we will probably seek a new line in the department anyway due to enrollment pressures from Engineering / COBA / Nursing as we have become somewhat adjunct dependent at the 100 level.

3. If the plan includes part-time instructors, include total cost per year for adjunct pay.

- The total cost of adjuncts to support this program are $5000 every other year or $2500 per year initially. If Mr. Smallwood stops adjuncting, we will need to secure an additional adjunct to cover his classes at the cost of $15,000 per year. This will not be needed with an additional faculty line as described in 5.A.2.

B. Impact on existing programs. Identify any existing programs/majors from which the new program would draw students and estimate enrollment effects on existing programs in the home department or other departments.

   We would expect this program to have some impact across the following areas:

   1. CS Department - We expect a significant interest from this student population. Some may decide to switch majors while others may pick up a double major or minor.
   2. Engineering/Physics - I do not think we will pull from this group but may add some double majors or minors.
   3. Mathematics - I expect to see a decline in BS Math majors. We currently attract around 3-5 per year. The BS math major should still remain though as there are no courses that exist specifically to serve that degree and it does provide a good entry path for graduate studies for students that pursue it. I do not see this impacting our actuarial science or BA math degrees in any significant way.
   4. Pre Health - I expect to see some level of interest from this group, but only for the minor or double major possibility. I do not see us pulling any majors from them. Estimate = 0 majors per year from Pre Health Professionals / Biology.

C. Program director. Identify the program director (who may or may not be the department chair). If the program director does not have a terminal degree in the discipline, provide a justification of the director's qualifications.

   Randy Nguyen will serve as program director and will be assisted by John Ehrke (department chair) in running the program.

D. Staff requirements. Indicate need for new staff (providing expected salary range and forecast suitable applicant availability) and evaluate effect on existing loads of current staff who will serve the program.

No new staff are needed.

E. Library resources. Identify discipline-specific library resources necessary to serve the requirements of the program. These may be existing holdings and services and new ones.

Additionally,

1. Describe how faculty and students will access information electronically and on site, and explain how they will receive instruction about how to do this.

   I do not expect to need any new holdings or services from the library to support this program. Most of the tools used by this program are open source and freely available to the public. Textbooks being used for the program are also open source. This is due to the nature of the content being in a constant state of update; constant upkeep of libraries, packages, and data sets along with the evolution of analytical tools keeps the materials freely available.

   Students learn about Python and R in CS 120, MATH 287 and MATH 377. Excel and Tableau are discussed in IS 222 and IT 263. The first week in each of those classes is devoted to getting students set up with the proper technology and references for these tools. The same is true of SAS in MATH 477. We will use Jupyter notebooks (or Google Collab) for working in Python and R Studio for working in R. These are already available through the MATH VDI so no additional support from IT will be needed other than ongoing maintenance. Students will also have the option to download these directly to personal computers for work in and out of the classroom.

   We will coordinate with Engineering/Physics and CS on versioning and editors so students in those disciplines have a seamless experience in our program.

2. Describe requirements to support students in their access to and use of learning resources.

   It is recommended for students in this degree to have a laptop capable of running R and Python. For those that do not, the MATH VDI will have versions of Python and R Studio ready for use. SAS is provided via the VDI through a site license and taught through the lab in MATH 477.

   As mentioned previously, the library is minimally impacted by the degree since most materials are open source and available online free of charge.

F. Physical resources. Identify needs for classroom, lab, and office space and impacts on existing space use. List necessary equipment. Provide costs for any construction or equipment.

There are no additional physical resources needed to support the program. Dr. Nguyen already has an established office space. We already have a computer lab that serves the needs of the degree. No additional costs for construction or equipment are needed.

G. Scholarships. Will the unit provide any unique scholarships to students in the program?

Students in this degree are eligible to apply for the same scholarships for which all other math majors are eligible. This includes the McReynolds scholarship, the Jenna Jones memorial math scholarship, Mathematics Endowed Scholarship and the Hays scholarship. The Riggs and Bolin scholarships are for different specified degrees. If the program proves successful we will likely reach out to a few alumni in the area about supporting a scholarship fund for data science.

H. Recruiting. To whom should the degree be marketed? What additional recruiting beyond general recruiting to the university will be needed, and what costs will we incur?

A statistics and data science degree should be marketed to individuals with a strong background in mathematics, statistics, and computer science, including recent high school graduates and those looking to enter in quantitative fields like economics or physics. Additionally, we should attract students wishing to become professionals in diverse industries like healthcare, finance, technology, and e-commerce who are looking for a career in a high-demand, data-driven role.
For recent graduates and high school students

- Emphasize foundational skills: Highlight that a strong foundation in math (including calculus, probability, and statistics) and computer science is crucial.
- Showcase industry versatility: Illustrate that a data science degree is a gateway to a wide range of industries, not just tech. Use examples from retail, healthcare, and finance to show the broad applicability of the skills.
- Promote career growth: Position the degree as a way to build a future-proof career in an in-demand field with high growth potential.

For a broader audience

- Highlight the "data is everywhere" angle: Stress that data science is a fundamental skill for the modern economy, applicable in nearly every field, from agriculture to telecommunications.
- Focus on problem-solving and impact: Frame data science not just as a technical skill, but as a way to solve complex problems and drive decision-making in any organization.
- Focus on how “needed” graduates in this area are and how attractive students will look to employers with even so much as a minor in this area.

- Mention flexible career paths: Point out the benefits of a data science career, such as the potential for flexible work arrangements and the ability to switch roles or industries.
- Compelling degree for those looking to ride the current wave of advancement in AI technologies.

Costs are highly dependent on the nature of marketing strategy the university employs.

I. Additional cost to deliver the program. Total expenses from sections A to H. Clarify which expenses are one-time and which are ongoing.

Apart from faculty time invested to teach the degree as outlined in 5.A. there is no additional cost to deliver this track.

Stop here and resubmit to the vice provost. Section 8 is not required for all applications, and you will only need to complete it if requested by the SACSCOC liaison.

8. Additional Information Required for Substantive Changes
    1. Student support services. Describe specific programs, services, and activities that will support students enrolled in the program. Some examples of academic support services are teaching and resource centers, tutoring, academic advising, counseling, disability services, diversity and inclusion offices, teaching laboratories, career services, testing centers, student life, and information technology.

    2. Describe financial resources available to support the new program, including a budget for the first year of the program; projected revenues, expenditures, and cash flow; amount of resources going to external institutions or organizations contracted to provide support services for the program; the operational, management, and physical resources available for the change.

    3. Provide contingency plans in the event required resources do not materialize.

Approvals

The proposal aligns with institutional policies and processes, and the campus is prepared to support the proposed program as presented.

Vice Provost Date

The library has sufficient resources to support the program, or the comments below outline additional acquisitions required and their associated costs.

Associate Dean of the Library Date
Comments, if needed:

We have developed a pro forma budget for the graduate program under consideration.

Associate Provost for Residential Graduate Programs Date

This proposal connects the program's student learning outcomes, curriculum, and assessment plan completely and is prepared to begin assessment.

Assistant Vice President for Academic Affairs Date

This proposal does not require additional review for institutional accreditation purposes, or I have worked with the faculty to gather the information necessary to notify SACSCOC or gain its approval.

SACSCOC Liaison Date

Step 3: Curriculum Approval Process

When all signatures are complete, attach an Abilene Approval Chart for Curriculum Changes, conduct the department faculty vote to approve the new program, and continue the approval process as specified by the approval chart.

Updated 8/1/2023

Market Analysis

30.7001 Data Science, General — Bachelor's
30.7101 Data Analytics, General — Bachelor's
27.0501 Statistics, General — Bachelor's

Jessica Smith — February 13, 2026

Program Comparisons and Competitors

National Trends

Programs focused on data science reside in at least two distinct 2-digit CIP families.

The CIP codes include:

- 30.7001 Data Science, General, which is the CIP code suggested by faculty, is the fastest-growing. It's at 142 institutions (up 992% in 5 years; there were no programs with students completing in 2019, and only 13 institutions had such programs in 2020). In 2024, 2,479 students completed the program, a 2,851% rise from the first 84 completions in 2020. In Texas, there are 168 completions at seven institutions: three private institutions (SMU, Baylor, and Incarnate Word) and four public (UT Dallas, UNT, University of Houston-Downtown, and UT Arlington). UNT's was the most recently added, with its first completions in 2024. Four of the institutions (SMU, UT Dallas, UNT and Houston) have 25 or more completions; the remaining three account for less than 15% of the state's market share.
- 30.7101 Data Analytics, General, is the smallest but also growing substantially. Thirty-three institutions (up 725% in 5 years; the first completions were 77 students in 2020) offer the program with 172 completions (up 123% in 5 years). Only three programs nationally (Drake University, Miami Dade College, and Dickinson College) have more than 10 completions in 2024. The majority of completions are at private institutions. SFA is the only institution in Texas to offer the program, which had its first completions in 2022 and included just four students in 2024.
- 27.0501 Statistics, General, has the most modest growth but the greatest number of students. In 2024, 141 institutions nationally offered the program (up 13% in 5 years) with 4,220 completions (up 1% in 5 years). Private not-for-profit institutions have about 26% of the market share nationally but have 57% in Texas, where six institutions have 135 completions (up 26% in 5 years). These include A&M, SMU, Rice, UTSA, Baylor, and UTRGV.

These three CIP codes combined are offered at 279 institutions (up 102% in 5 years) with 6,871 completions (up 59% in 5 years).

Five schools in ACU's admissions peer group (Texas A&M, UNT, Baylor, UTSA, and Harding) offer a program in one of these CIP codes; four (Texas Tech, Texas State, Samford, and Lipscomb) do not. These represent the institutions that ACU students most frequently consider.

Programs in business (30.7102) and financial analytics (30.7104) are also rapidly growing and reside in the same 4-digit CIP family with data analytics. Seventy-eight institutions offer these programs, with 1,988 graduates in 2024. The list of institutions offering these programs is qualitatively different than the preceding CIP codes, reflecting nearly two-thirds market share for private institutions. Many of these programs are in business schools and include UPenn, BYU, Ohio, Drexel, and Syracuse. In Texas, the schools offering these programs include UNT, Lamar, UT Dallas, UT Austin, UTSA, East Texas A&M, UNT Dallas, and UT Arlington. The business and financial analytics programs have been excluded from this analysis.

In Texas

Twelve institutions (double the number 5 years ago) graduated 187 students (up 187% in 5 years) in one of the three programs.

Texas had just 4.5% of graduates nationally in these programs in 2024. SMU serves nearly a third of the students alone, and more than three-quarters graduate from five institutions (SMU, A&M, UT Dallas, UNT, and Rice), with the other seven institutions comprising 24% of graduates.

Tuition costs fall into two groups; SMU, Rice, and Baylor have IPEDS tuition and fee rates of $55,000-$64,000, and the remaining nine schools cost $7,500-$14,500.

Considering all three programs together, the mean number of completions per institution is 25.6, and the median is 23.5. Looking at 30.7001 alone, the mean is 24 completions, and the median is 27. These central tendencies refer to seven institutions with 168 completions.

The fact that the number of institutions and completions in statistics has held steady or increased slightly while data analytics has established and grown sharply indicates a distinct market for both. It will be important for a program intending to carry a combined name of "statistics and data science" to clearly define its scope since several Texas schools that ACU applicants will be aware of, including SMU and Baylor, have separate programs in both statistics and data science.

For Section 4.D, I know that you have worked ahead and already looked at a number of schools. Feel free to leave those in the application, but please make sure to address these four programs: either Texas A&M *or* UT San Antonio in statistics (27.0501), UNT in data science (30.7001), and *both* Baylor's program in statistics and in data science.

Enrollment Expectations

In 30.7001 alone, the mean number of completions is 24, and the median is 27. Evaluating only private not-for-profit institutions is generally more indicative, but comparing only three institutions in Texas doesn't give the central tendencies much meaning (mean 22, median 16). Across the United States, 84 private not-for-profit institutions offer the program with 826 completions, for a mean of 9.8 and median of 4. Using a national number isn't perfect since the growth in program popularity is stronger elsewhere in the country than in Texas.

To predict enrollment, I typically estimate five times the median to take into account attrition before graduation, which suggests about 20. Turning to another prediction source, Gray's program prediction tool does not include CIP code 30.7001; it suggests that 30.7101 would have 7-10 students and 27.0501 would have 4-10 students.

The conflicting information is a challenge to interpret. Performing at the state median overall seems optimistic given the tuition differences of the schools involved, and the Gray data are not specific enough to the area. They are, however, consistent in size with predictions for other undergraduate programs at ACU.

For Section 3.E, I suggest an estimated enrollment of 15.

Jobs Outlook

There's a greater predicted growth in Texas (42.6%) than the nation as a whole (21.1%) for the target occupations in related to data science, data analytics, and statistics in 2022-32, and Texans earn slightly more ($116,800) than the median for the nation ($113,900). This information may inform your response to **Section 4.B.2**.

Reviewing the lists of specialized skills, common skills, and software skills that are most commonly included in job descriptions in this area are an important guide for curriculum at the course and assignment level in the program. Focusing on skills classified as "rapidly growing" can provide students a competitive advantage over those from existing programs that have not yet adapted.

Educating Christian Students for Service and Leadership Throughout the World

College of Business Administration
ACU Box 29300, Abilene, TX 79699-9300
325-674-2245

ABILENE CHRISTIAN
College of Business Administration

To: Wes Crawford, Vice Provost
From: Laura Phillips, Associate Dean, College of Business Administration
Brent Reeves, Director, School of Information Technology & Computing
CC: John Ehrke, Department Chair, Mathematics
Date: Nov. 11, 2026
RE: Proposed Major and Minor—Statistics and Data Science

Brent Reeves and I met with John Ehrke to review the proposed BS in Math SDS degree and the proposed minor in Statistics and Data Science. In general, we think it is valuable to contribute to degrees which integrate resources that are available in various locations on campus, and we are happy to partner with the math department to contribute expertise that already exists in COBA, primarily in SITC. We understand that we will need to provide capacity in several courses to accommodate SDS students and we will make the adjustments necessary as enrollment ramps up.

We are also appreciative that John and the rest of the math department crafted the minor in such a way that it is accessible to our business students. I hope that we will be able to effectively promote the minor to students in our various analytics tracks and that the SDS minor will become an attractive add-on for business students who are interested in analytics.

Sincerely,

Laura Phillips
Associate Professor of Management
Associate Dean, College of Business Administration

ABILENE CHRISTIAN UNIVERSITY
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November 11, 2025

Dear Department of Mathematics and University Councils:

This is a memo of support for the proposed Data Science degree, Biosciences Track. This is a much needed degree in the field of biological sciences. We also support the inclusion of all of the BIOL courses listed in the proposal. The Department of Biology currently has a course, BIOL 483 Biostatistics, in the catalog. We have not taught this course in several years due to prior low enrollment. We are interested in cross-listing MATH 486 Biostatistics with BIOL 483 since there is significant overlap between the proposed MATH 486 and BIOL 483.

On behalf of the Department of Biology,

Jennifer Huddleston

Jennifer R. Huddleston, Ph.D.
Associate Professor
Department Chair
Department of Biology
Abilene Christian University
202 Halbert-Walling Research Center
ACU Box 27868
Abilene, Texas 79699-7868
jennifer.huddleston@acu.edu

To Whom It May Concern:

I am writing to express the strong support from the Department of Engineering and Physics for the proposed Statistics and Data Science BS and minor. These new programs will bring new opportunities for students in our programs especially those interested in computational physics. We anticipate to require several of these courses in an updated version of the PHYC Computational Physics track and several of the new courses will become required or elective options within all the Physics tracks.

From my experience talking to industry contacts this program will bring significant value to ACU students and provide the necessary training for students to enter many fields like Data Analytics, Machine Learning, and Artificial Intelligence more easily. It is important to note the impact many of these courses will have on STEM majors as they will be able to add new courses to improve their knowledge in statistics and data science which is becoming ever more important as new technology leads to ever larger data sets that are more complex and can only be tackled using techniques that will be covered in these new courses. This will add to the ability of ACU students to engage in meaningful scientific research while they are still undergraduates at ACU.

We are also committing to ensure that the PHYS 453 course is available for students choosing these new programs.

Sincerely,

Larry Isenhower

Dr. Larry Isenhower
Co-Chair
Department of Engineering and Physics

Brent Reeves
brent.reeves@acu.edu
Feb 24, 2026

To: Mathematics Department

Re: Dropping Math 187

The School of Information Technology and Computing is ok with dropping Math 187.
We currently list it as required in some of our programs, but will change those requirements to Math 278.

Brent Reeves
Director School of Information Technology and Computing

	Student Learning Outcomes																
Required Courses	SDS-1A: Foundational Knowledge: College Algebra, Precalculus, and Calculus	SDS-1B: Foundational Knowledge: Algebraic Structures	SDS-1C: Foundational Knowledge: Statistics and Probability	SDS-1D: Foundational Knowledge: Discrete Structures	SDS-1E: Foundational Knowledge: Programming	SDS-2A: Data Skills: Data Cleaning and Wrangling	SDS-2B: Data Skills: Exploratory Data Analysis	SDS-2C: Data Skills: Data Visualization	SDS-2D: Data Skills: Data Ethics	SDS-3A: Model Formulation: Model Selection and Validation	SDS-3B: Model Formulation: Supervised Learning	SDS-3C: Model Formulation: Unsupervised Learning	SDS-3D: Model Formulation: Reinforcement Learning	SDS-4A: Vocational: Teamwork and Consultation	SDS-4B: Vocational: Life-long Learning	SDS-4C: Vocational: Communication	SDS-4D: Vocational: Internships
MATH 101 - Introduction to the Math Major	I	I	I	I	I	I	I	I	I				I	I	I	I	I
MATH 185 - Calculus I	I	I															
	R	R															
	A	A															
MATH 186 - Calculus II	I	I		I													
	R	R		R													
	A	A															
MATH 227 - Discrete Mathematics				I													
	R	R		R													
	A			A													
MATH 278 - Computational Mathematics Lab	I	I		I	I	I											
	R	R		R	R												
	A				A												
MATH 325 - Linear Algebra		I															
		R			R												
		A															
MATH 377 - Statistical Methods I	I		I	I	I	I	I	I	I	I	I			I		I	
	R		R	R	R	R	R			R				R		R	
			A		A												
	I		I		I			I	I	I				I		I	I

SDS 387 - Data Visualization in R and Python	R		R		R			R	R	R				R		R	R
	A				A			A						A		A	
SDS 396 - SDS Seminar	I	I	I	I	I	I	I	I	I	I				I	I	I	I
	R	R	R	R	R	R	R	R	R	R				R	R	R	R
							A		A					A	A	A	
SDS 475 - Sports Analytics			I			I	I	I	I	I	I	I	I	I		I	I
			R			R	R	R	R	R	R	R	R	R		R	R
			A			A	A	A	A	A				A		A	
MATH 477 - Statistical Methods II			I		I	I	I	I		I	I	I	I			I	
			R		R	R	R			R	R	R	R			R	
			A		A	A	A			A	A						
MATH 478 - Mathematical Statistics	I		I														
	R		R														
	A		A														
SDS 479 - Multivariate Analysis			I		I	I	I	I		I	I	I					
		R	R		R	R	R	R		R	R	R					
			A		A		A			A	A	A					
SDS 486 - Biostatistics			I		I	I	I	I		I	I	I					
		R	R		R	R	R	R		R	R	R					
			A		A		A			A	A	A					
SDS 496 - SDS Capstone						I	I	I	I	I				I	I	I	I
						R	R	R	R	R				R	R	R	R
						A	A	A		A				A	A	A	
PHYS 453 - Machine Learning					I	I	I	I	I	I	I	I	I				
					R	R	R	R		R	R	R	R				
					A	A	A	A		A	A	A	A				
					I	I	I										

CS 120 - Programming I					R													
CS 130 - Programming II					I	I	I											
					R													
IT 220 - Introduction to Databases and Database Management Systems					I	I	I		I									
					R	R												
IT 263 - Analytics II: Data Management					I	I	I	I	I									
					R	R	R	R	R									
					A	A												
IS 432 - Analytics III: Data Mining					I	I	I	I	I									
					R	R	R		R									
					A	A	A											
MATH 498 - Mathematical Internship															I	I	I	I
															R	R	R	R
															A	A	A	A