

**ACADEMIC SENATE  
of  
CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
San Luis Obispo, CA**

**AS-1009-26**

**RESOLUTION ON NEW BACHELOR OF SCIENCE DEGREE PROGRAM IN DATA SCIENCE**

- 1 **WHEREAS,** Data science has emerged as a critical interdisciplinary field integrating statistics,  
2 computer science, and domain knowledge to extract insights from data; and
- 3 **WHEREAS,** There is strong and growing workforce demand for graduates with data science skills  
4 across industries including technology, healthcare, agriculture, business, and government;  
5 and
- 6 **WHEREAS,** The CSU system and peer institutions have expanded data science and related programs  
7 to meet student demand and workforce needs; and
- 8 **WHEREAS,** Cal Poly’s Learn by Doing philosophy is well aligned with the applied, project-based nature  
9 of data science education; and
- 10 **WHEREAS,** Existing courses and faculty expertise across departments such as Computer Science,  
11 Statistics, and related disciplines provide a strong foundation for a high-quality  
12 interdisciplinary program; and
- 13 **WHEREAS,** Student interest in data science is evidenced by enrollment demand in related courses,  
14 minors, and concentrations; and
- 15 **WHEREAS,** The proposed Bachelor of Science in Data Science has been reviewed through appropriate  
16 college and university curriculum processes; and
- 17 **WHEREAS,** The program supports Cal Poly’s mission and strategic priorities by preparing graduates  
18 for high-impact careers and advanced study in a data-driven world; therefore be it
- 19 **RESOLVED:** That the Academic Senate of California Polytechnic State University, San Luis Obispo,  
20 approve the establishment of a Bachelor of Science in Data Science; and be it further
- 21 **RESOLVED:** That the program be implemented contingent upon final approval by the Chancellor’s  
22 Office and availability of appropriate resources.

**Academic Programs, Innovations and Faculty Development**

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California State University  
Degree Program Proposal Template  
Revised April 2022

**Please note:**

- Campuses may mention proposed degree programs in recruitment material if it is specified that enrollment in the proposed program is contingent on final program authorization from the CSU Chancellor's Office.
- Approved degree programs will be subject to campus program review within five years after implementation. Program review should follow system and Board of Trustee guidelines (including engaging outside evaluators) and should not rely solely on accreditation review.
- ***Please refer to the document "Tips for Completing a Successful Program Proposal" before completing the Program Proposal Template.***

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**Cal Poly Instructions:**

- **Do not remove** the prompts from the template.
- Respond to each prompt directly under the item.
- Self-Support programs must also complete a budget. Ask APP for the template if you have not received it.
- Update the Index upon completion of the template so the page numbers will update. Click in the index, select update table, and then select update entire table.
- Using the Review tab in Word, insert comments where you have questions for APP.
- APP will do a preliminary review of the proposal before it is circulated to curriculum committees and after any changes are made as a result of campus reviews. Once the preliminary review is completed, make all subsequent changes with Word Track Changes turned on and save updated versions with the editor and date appended to the document name (Example: BS\_DataScience\_NewDegreeProposal\_CENG\_20250106).
- Complete the faculty checklist. It will be appended to the beginning of this document before submittal to the CO.
- Once all approvals on campus have taken place, APP will remove this cover page and replace it with a Cal Poly cover page.



Degree Designation (e.g., BA, MS, etc.)	<b>BS</b>
Campus Specific Degree Title	<b>Data Science</b>
CSU Degree Title	<b>Bachelor of Science in Data Science</b>
CIP Code (APP provides)	CSU code: 17035   CIP: 30.7001
CIP Code Degree Title (APP provides)	Data Science
Requested Start Term	<b>Fall 2027</b>
College	<ul style="list-style-type: none"> <li>• College of Engineering</li> <li>• Bailey College of Science and Mathematics</li> </ul>
Department	<ul style="list-style-type: none"> <li>• Computer Science and Software Engineering</li> <li>• Statistics</li> <li>• Mathematics</li> </ul>
Proposer Contact Name(s), Position(s), and Email(s)	<p>Dr. Paul Anderson, <a href="mailto:pander14@calpoly.edu">pander14@calpoly.edu</a>, Professor, Computer Science and Software Engineering</p> <p>Dr. Alex Dekhtyar, <a href="mailto:dekhtyar@calpoly.edu">dekhtyar@calpoly.edu</a>, Professor, Computer Science and Software Engineering</p> <p>Dr. Jonathan Ventura, <a href="mailto:jventu09@calpoly.edu">jventu09@calpoly.edu</a>, Associate Professor, Computer Science and Software Engineering</p> <p>Dr. Foaad Khosmood, <a href="mailto:foaad@calpoly.edu">foaad@calpoly.edu</a>, Professor, Computer Science and Software Engineering</p> <p>Dr. Lubomir Stanchev, <a href="mailto:lstanche@calpoly.edu">lstanche@calpoly.edu</a>, Professor, Computer Science and Software Engineering</p> <p>Dr. Christopher Lupo, <a href="mailto:clupo@calpoly.edu">clupo@calpoly.edu</a>, Professor, Director of Noyce School of Applied Computing</p> <p>Dr. Kelly Bodwin, <a href="mailto:kbodwin@calpoly.edu">kbodwin@calpoly.edu</a>, Associate Professor, Statistics</p> <p>Dr. Hunter Glanz, <a href="mailto:hglanz@calpoly.edu">hglanz@calpoly.edu</a>, Associate Professor, Statistics</p> <p>Dr. Andrew Schaffner, <a href="mailto:aschaffn@calpoly.edu">aschaffn@calpoly.edu</a>, Professor, Statistics</p> <p>Dr. Aaron Keen, <a href="mailto:akeen@calpoly.edu">akeen@calpoly.edu</a>, Professor and Chair, Computer Science and Software Engineering</p> <p>Dr. Elena Dimitrova, <a href="mailto:edimitro@calpoly.edu">edimitro@calpoly.edu</a>, Professor, Mathematics</p> <p>Dr. Benjamin Richert, <a href="mailto:brichert@calpoly.edu">brichert@calpoly.edu</a>, Professor, Mathematics</p> <p>Dr. Kevin James Ross, <a href="mailto:kjross@calpoly.edu">kjross@calpoly.edu</a>, Professor, Statistics</p>

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**1. Program Type (Select all that apply)**

- a. New Program (previously authorized as a projection by the BOT)
- b. Fast Track (bachelor's or master's only; not already on Campus Academic Plan)
- c. State-Support
- d. [Self-Support](#)
- e. Delivery Format:
  - Fully face to face
  - Hybrid
  - Fully online

**Note:** For new Pilots and Pilot Conversions use:

[Pilot Proposal template](#)

[Pilot Conversion template](#)

**2. Program Identification**

- a. Campus

**Response:**

California Polytechnic State University, San Luis Obispo

- b. Full and exact degree designation and title (e.g., Master of Science in Genetic Counseling, Bachelor of Arts in History).

**Response:**

Bachelor of Science in Data Science

- c. Date the Board of Trustees approved adding this program projection to the Campus Academic Plan.

**Response:**

March 26, 2025

- d. Term and academic year of intended implementation (e.g., fall 2024).

**Response:**

Fall 2027

- e. Total number of units required for graduation. This will include all requirements (General Education and campus-specific graduation requirements), not just major requirements.

**Response:**

120 units

- f. Name of the department(s), division, or other unit of the campus that would offer the proposed degree program. Please identify the unit that will have primary responsibility.

**Response:**

There are three departments located in two colleges that will jointly operate the program:

- Department of Statistics, Bailey College of Science and Mathematics (BCSM)
- Department of Computer Science and Software Engineering, College of Engineering (CENG)
- Department of Mathematics, BCSM

As described in the Memorandum of Understanding developed by BCSM and CENG in November 2024 and attached as Appendix A, BS Data Science will be a free-standing program jointly owned by both colleges. Students will apply to and enroll as BCSM students. A co-director from each college will report to their respective college dean, also with dotted line reporting to the Director of the Noyce School of Applied Computing. The BS Data Science faculty co-directors will work together to plan course schedules, monitor enrollments, and advise students. The program will have a curriculum committee which manages curriculum, and which reports to the program. For faculty members wishing to affiliate with the BS Data Science program, the departments will develop MOUs that define how their workload is split between this program and their home program.

- g. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree program.

**Response:**

- Dr. Paul Anderson, Professor, Computer Science and Software Engineering
- Dr. Alex Dekhtyar, Professor, Computer Science and Software Engineering
- Dr. Elena Dimitrova, Professor, Mathematics
- Dr. Hunter Glanz, Associate Professor, Statistics
- Dr. Kelly Bodwin, Associate Professor, Statistics
- Dr. Kevin James Ross, Professor, Statistics

- h. Statement from the appropriate campus administrative authority that the addition of this program supports the campus mission and will not impede the successful operation and growth of existing academic programs.

**Response:**

See Appendix B: Combined College/School Letter of Support, signed by CENG Interim Dean Robert Crockett, BCSM Dean Dean Wendt, and Noyce School of Applied Computing Director Christopher Lupo, May 1, 2025.

- i. Any other campus approval documents that may apply (e.g., curriculum committee approvals).

**Response:**

See Appendices C1 – C5:

- C1. STAT, CSSE, MATH Department Curriculum Committee approvals
- C2. BCSM, CENG Curriculum Committee approvals
- C3. Academic Senate Curriculum Committee approval
- C4. Academic Senate Resolution
- C5. Presidential approval

j. Substantive Change Screening Form:

- . The [WASC Senior College and University Commission \(WSCUC\)](#) requires that the campus Accreditation Liaison Officer submit a Substantive Change Screening Form via the Accreditation Management portal for any proposed degree program. If it is determined that no substantive change review is required, please attach a separate document containing the email response from WSCUC.

**Response:**

See Appendix D: Notification from WSCUC (April 2, 2025) that substantive change review is not required for this new degree program.

- i. If the proposed program is subject to WSCUC substantive change review, the campus shall submit a copy of the WSCUC Substantive Change proposal in lieu of this CSU proposal format. If campuses choose to submit the WSCUC Substantive Change Proposal, they will also be required to submit a program assessment plan using the format found in the CSU program proposal template.

**Response:**

N/A

k. Proposed Classification of Instructional Programs (CIP) and CSU Degree Program Code.

Using a master list of degree programs and reporting codes, campuses report data to the Chancellor's Office on applications, enrollments, and degrees granted. To ensure consistent record keeping, campuses use the same pairings of generic systemwide degree program titles and corresponding reporting codes. The required curriculum for each CSU degree program title (and level) is roughly comparable across the system and reflects the Classification of Instructional Programs ([CIP](#)) program definition for each CIP code. Campuses are allowed to use a slightly different campus-specific title, as long as it is reasonably similar to the official title. The program codes, however, remain the same across the system. The CSU Degrees Database has fields for the official "generic" CSU title and a campus-specific title.

Campuses should suggest one CSU degree program code and one corresponding CIP code. The official list of approved systemwide degree titles and their assigned CSU and CIP reporting codes may be found in the [CSU Program Codes and Corresponding CIP Codes](#). If an appropriate CSU code does not appear on the system-wide list, you can search CIP 2020 <https://nces.ed.gov/ipeds/cipcode/default.aspx?y=56> to identify the code that best matches the proposed degree program. The CSU degree program code and CIP code will be assigned when the program is approved by the Chancellor.

**Response:**

Data Science: CSU code: 17035 | CIP: 30.7001

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.

**3. Program Overview and Rationale**

- a. Provide a brief descriptive overview of the program citing its 1) purpose and strengths, 2) fit with the institutional mission or institutional learning outcomes and 3) the compelling reasons for offering the program at this time.

**Response:**

The field of data science is a growth area for universities around the world. Institutions such as University of California, Berkeley; San Diego State University; University of California, Santa Barbara; Santa Clara University; University of California, Irvine; University of California, Los Angeles; and University of Southern California have established institutes, centers, and/or academic programs in DSA (Data Science and Analytics) in the past five years. The digital transformation of the past decade has included cloud computing, software as a service, Internet of Things, visualization, geographic information systems, and large amounts of structured and unstructured data. This significantly impacts academic research with novel access to information, unprecedented computing power, accessible data and computing services, integrations of data across platforms, and software advances like deep learning. It has also generated new educational offerings such as undergraduate and graduate programs. U.S. News and World Report ranks dozens of B.S. and M.S. programs in data science at universities that Cal Poly considers as peer, competitor, and aspirant institutions.

Society needs greater advancement in data science. Cal Poly can help achieve this goal by producing more graduates who are ready for a variety of positions in the private sector, government, and academia. Students, faculty, and community members who do not define themselves as data scientists or data analysts also need to be data literate to thrive in the world as it is. Cal Poly is in a unique position to design research and learning opportunities via its Learn by Doing model to produce graduates from all disciplines and colleges who possess the problem-formulation, statistical, computing, and decision-making skills to solve the world's most pressing problems, while advancing the exciting and fast-growing field of data science and analytics.

Cal Poly was among the pioneers in California, establishing the Cross-Disciplinary Studies Minor (CDSM) in Data Science in 2016, which to date has graduated seven cohorts. The proposed undergraduate program takes advantage of the involved colleges' and departments' experience of administering the CDSM in Data Science. The program is proposed in recognition that Data Science has emerged as a field that requires a unique set of learning objectives and broad participation among computational disciplines. The B.S. in Data Science will equip students with the skills and qualifications necessary to pursue jobs as data scientists, data engineers, machine learning engineers, and data analysts.

This new program seeks to become the third degree-granting interdisciplinary program at Cal Poly, with a commitment to maintaining an equal partnership between the three departments (Computer Science and Software Engineering, Mathematics, and Statistics) across two colleges (College of Engineering and Bailey College of Science and Mathematics).

This program may participate in year-round operations, if it is determined to be a good candidate.

b. Provide the proposed catalog description. The description should include:

i. a narrative description of the program

The Bachelor of Science (BS) in Data Science is an interdisciplinary program that prepares students to analyze, interpret, and derive insights from complex data. The curriculum combines foundational knowledge in mathematics, statistics, computer science, and domain-specific applications, providing students with the skills necessary for careers in data analysis, machine learning, and big data management. Students gain proficiency in programming in multiple languages, data visualization, data mining, and predictive modeling, while engaging in hands-on projects with real-world data. This program equips graduates to excel in data-driven decision-making roles across diverse industries.

ii. admission requirements

Cal Poly employs a Multi-Criteria Admission (MCA) process, evaluating applicants based on both academic and non-academic factors.

iii. a list of all required courses for graduation including electives, specifying course numbers, course titles, prerequisites or co-requisites (ensuring there are no “hidden prerequisites” that would drive the total units required to graduate beyond the total reported in 2e above), course unit requirements, and any units associated with demonstration of proficiency beyond what is included in university admission criteria.

The BS Data Science proposed curriculum is as follows:

**Required Courses (57 units):**

- **CSC 1001: Fundamentals of Computer Science (3 units)**
  - Prerequisites: MATH 1004 with a grade of C- or better or MATH 1006 with a grade of C- or better
  - Concurrent: CSC 1001L
- **CSC 1001L: Fundamentals of Computer Science Laboratory (1 unit)**
  - Prerequisites: MATH 1004 with a grade of C- or better or MATH 1006 with a grade of C- or better
  - Concurrent: CSC 1001
- **CSC 2001: Data Structures (3 units)**
  - Prerequisites: CSC 1001
  - Concurrent: CSC 2001L
- **CSC 2001L: Data Structures Laboratory (1 unit)**

- Prerequisites: CSC 1001
- Concurrent: CSC 2001
- **DATA 2000: Data Science Seminar (1 unit)**
  - Prerequisites: Sophomore standing
- **DATA 3301: Introduction to Data Science (4 units)**
  - Prerequisites: MATH 1151 and CSC 1001; and STAT 1510 or STAT 3210
- **DATA 4401: Data Science Process and Ethics (4 units)**
  - Prerequisites: DATA 4610
- **DATA 4460: Senior Project - Data Science Capstone (2 units)**
  - Prerequisites: DATA 4401
- **DATA 4610: Fundamentals of Machine Learning (4 units)**
  - Prerequisites: DATA 3301 and MATH 2621
- **DATA 4620: Foundations and Applications of Deep Learning (4 units)**
  - Prerequisites: DATA 4610
- **MATH 1151: Linear Algebra (3 units)**
  - Prerequisites: MATH 1261 or MATH 1264
- **MATH 1264: Calculus for Data Science 1 (4 units)**
  - Prerequisites: Appropriate Math Placement Level or MATH 1005 or MATH 1007
  - GE Area 2 for 3 units
- **MATH 1265: Calculus for Data Science 2 (4 units)**
  - Prerequisites: MATH 1264
- **MATH 2031: Transition to Advanced Mathematics (3 units)**
  - Prerequisites: MATH 1262 or MATH 1263 or MATH 1265
- **MATH 2621: Introduction to Mathematical Optimization (3 units)**
  - Prerequisites: MATH 1265 or MATH 2263; MATH 1151 or MATH 2341
- **STAT 1510: Statistics 1 (3 units)**
  - Prerequisites: MATH 1004, MATH 1005, MATH 1006, or MATH 1007
- **STAT 2610: Introduction to Probability and Simulation (3 units)**
  - Prerequisites: MATH 1261 or MATH 1264 or MATH 1267; and BUS 3392 or CSC 1001 or CSC 1032 or DATA/STAT 1810 or ECON 3015
- **STAT 3520: Statistics 2 (3 units)**
  - Prerequisites: STAT 1110 or STAT 1510 or STAT 3210; and MATH 1006 with a grade of C- or better, or appropriate Math Placement Level
- **STAT 3530: Applied Linear Models (4 units)**
  - Prerequisites: STAT 1220, STAT 3210, or STAT 3520; and MATH 1151 or MATH 2341

**Concentrations (23 units; Mathematical Foundations concentration includes 3 units of GE)**

**Ethics Elective (Satisfies Upper Division GE 3)**

3 units from the following:

- PHIL 3322: Philosophy of Technology (3 units)
  - Prerequisites: Completion of GE Area A with grades of C- or better; one course in GE Area B4 with a grade of C- or better; and completion of GE Area C2.
- PHIL 3323: Ethics, Science, and Technology (3 units)
  - Prerequisites: Completion of GE Area A with grades of C- or better; one course in GE Area B4 with a grade of C- or better; and completion of GE Area C2.
- PHIL 3327: Robot Ethics (3 units)

- Prerequisites: Completion of GE Area A with grades of C- or better; one course in GE Area B4 with a grade of C- or better; and completion of GE Area C2.

**General Education (43 units, 6 of which are specified in Support Courses; 37 units remaining (3 units in the Mathematical Foundations concentration))**

- Area 1A (3 units)
- Area 1B (3 units)
- Area 1C (3 units)
- Area 2 (in Support Courses)
- Area 3A (3 units)
- Area 3B (3 units)
- Area 4A (3 units)
- Area 4B (3 units)
- Area 5A (3 units)
- Area 5B (3 units)
- Area 5C (1 unit)
- Area 6 (3 units)
- Upper-Division Area 2 or Upper-Division Area 5 (3 units)
  - Mathematical Foundations Concentration requires MATH 3351 (UD 2)
- Upper-Division Area 3 (in Support Courses)
- Upper-Division Area 4 (3 units)

**Concentrations**

At the initiation of the program, the BS in Data Science will include three concentrations:

1. Mathematical Foundations
2. Statistical Modeling
3. Machine Learning Engineering

**Concentration in Mathematical Foundations (26 units)**

A focus on theoretical foundations and computational modeling.

- **MATH 2343: Differential Equations (3 units)**
  - Prerequisites: MATH 1151 and MATH 1265
- **MATH 3055: Graph Theory (3 units)**
  - Prerequisites: Junior standing and MATH 2031
- **MATH 3152: Advanced Linear Algebra (4 units)**
  - Prerequisites: MATH 1151 and MATH 2031
- **MATH 3351: Differential Equations and Boundary Value Problems (GE Area 2) (3 units)**
  - Prerequisites: MATH 2343 and MATH 1265
- **MATH 3622: Mathematics of Data Science (3 units)**
  - Prerequisites: MATH 1151 and MATH 2031 and CSC 1001
- **MATH 3651: Introduction to Numerical Analysis (3 units)**
  - Prerequisites: MATH 2343 and MATH 1265 and CSC 1001
- **MATH 4653: Numerical Optimization (3 units)**

- Prerequisites: MATH 3651
- **Electives**
  - **4 credits of free electives**

### **Concentration in Statistical Modeling (23 units)**

A focus on a variety of statistical modeling techniques for different data situations.

- **STAT 1810: Introduction to Statistical Computing with R (3 units)**
  - Prerequisites: DATA 1000, STAT 1110, STAT 1220, STAT 1510, or STAT 3210
- **STAT 3820: Intermediate Statistical Computing with R (3 units)**
  - Prerequisites: STAT 1810; and STAT 1220 or STAT 3210 or STAT 3520

Statistical Modeling Electives

Select 15 units from the following:

- **STAT 4740: Multilevel and Mixed Modeling (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530
- **STAT 4750: Bayesian Reasoning and Methods (3 units)**
  - Prerequisites: STAT 1110 or STAT 1220 or STAT 3210 or STAT 3520; and STAT 2610 or STAT 3210 or STAT 3310
- **STAT 4760: Statistical Analysis of Time Series (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530 or STAT 5430
- **STAT 4770: Survival Analysis Methods (3 units)**
  - Prerequisites: STAT 1220 or STAT 3210 or STAT 3520; and MATH 1265 or MATH 1262
- **STAT 4780: Categorical Data Analysis (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530
- **STAT 4790: Applied Multivariate Statistics (3 units)**
  - Prerequisites: STAT 1220 or STAT 3210 or STAT 3520 or STAT 5210; and MATH 1151 or MATH 2341
- **STAT 5550: Statistical Learning with R (3 units)**
  - Prerequisites: STAT 3530, STAT 1810; and STAT 2610 or STAT 3310

Electives

- **2 units of free electives**

### **Concentration in Machine Learning Engineering (23 units)**

- **CSC 3449: Algorithms and Complexity (4 units)**
  - Prerequisite: MATH 2031 and CSC 2001
- **DATA 3302: Data Visualization (4 units)**
  - Prerequisites: CSC 1001, STAT 1810
- **STAT 1810: Introduction to Statistical Computing with R (3 units)**
  - Prerequisites: DATA 1000, STAT 1110, STAT 1220, STAT 1510, or STAT 3210

**Database Elective(s) - Take one of (4 units):**

- **CSC 3665 : Introduction to Database Management Systems (4 units)**
  - Prerequisite: CSC 2001 and MATH 2031

OR

- **CSC 3660: Introduction to Databases (2 units)**
  - Prerequisite: CSC 2001 and MATH 2031

and

- **CSC 3662: Introduction to Non-relational Database Systems (2 units)**
  - Prerequisite: CSC 3665 or CSC 3660 or CSC 3001

Take a total of 8 units and at least 2 units from each of the following categories of electives:

**Modeling Elective(s) (2-6 units):**

- **CSC 4880: Artificial Intelligence (4 units)**
  - Prerequisite: CSC 2001
- **CSC 5887: Advanced Deep Learning (4 units)**
  - Prerequisite: CSC 4667 or DATA 4610
- **DATA 4632: Graph Mining (2 units)**
  - Prerequisite DATA 3301 and CSC 3449
- **MATH 2343: Differential Equations (3 units)**
  - Prerequisites: MATH 1151 and MATH 1265
- **MATH 3152: Advanced Linear Algebra (4 units)**
  - Prerequisites: MATH 1151 and MATH 2031
- **MATH 3351: Differential Equations and Boundary Value Problems (GE Area 2) (3 units)**
  - Prerequisites: MATH 2343 and MATH 1265
- **MATH 3622: Mathematics of Data Science (3 units)**
  - Prerequisites: MATH 1151 and MATH 2031 and CSC 1001
- **MATH 3651: Introduction to Numerical Analysis (3 units)**
  - Prerequisites: MATH 2343 and MATH 1265 and CSC 1001
- **MATH 4653: Numerical Optimization (3 units)**
  - Prerequisites: MATH 3651
- **STAT 4610: Probability Theory (3 units)**
  - Prerequisite: STAT 305 or STAT 2610; and MATH 1265, MATH 241, or MATH 2263; or graduate standing in Statistics.
- **STAT 4740: Multilevel and Mixed Modeling (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530
- **STAT 4750: Bayesian Reasoning and Methods (3 units)**
  - Prerequisites: STAT 1110 or STAT 1220 or STAT 3210 or STAT 3520; and STAT 2610 or STAT 3210 or STAT 3310
- **STAT 4760: Statistical Analysis of Time Series (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530 or STAT 5430
- **STAT 4770: Survival Analysis Methods (3 units)**
  - Prerequisites: STAT 1220 or STAT 3210 or STAT 3520; and MATH 1265 or MATH 1262
- **STAT 4780: Categorical Data Analysis (3 units)**
  - Prerequisites: STAT 3430 or STAT 3530
- **STAT 4790: Applied Multivariate Statistics (3 units)**

- Prerequisites: STAT 1220 or STAT 3210 or STAT 3520 or STAT 5210; and MATH 1151 or MATH 2341
- **STAT 5530: Generalized Linear Models (3 units)**
  - Prerequisites: STAT 334 or STAT 3530; and STAT 426 or STAT 4620
- **STAT 5550: Statistical Learning with R (3 units)**
  - Prerequisites: STAT 3530, STAT 1810; and STAT 2610 or STAT 3310

**Computing Elective(s) (2-6 units):**

- 
- **CSC 4820: Natural Language Processing (4 units)**
  - Prerequisites: CSC 4880 or DATA 3301
- **CSC 4880: Artificial Intelligence (4 units)**
  - Prerequisite: CSC 2001
- **CSC 4881: Semantic Computing (4 units)**
  - Prerequisite: CSC 4880
- **CSC 4888: Computer Vision (4 units)**
  - Prerequisite: CSC 3449 and PHIL 3323
- **CSC 4891: Seminars in Artificial Intelligence and Machine Learning (1 units)**
  - Prerequisite: CSC 4880 or DATA 4610
- **CSC 4892: Research Experience in Artificial Intelligence and Machine Learning (1-2 units)**
  - Prerequisite: CSC 4880 or DATA 4610; and PHIL 3323
- **CSC 4893: Projects in Artificial Intelligence and Machine Learning (1-2 units)**
  - Prerequisite: CSC 4880 or DATA 4610; and PHIL 3323
- **CSC 5571: Special Advanced Laboratory (1-2 units)**
  - Prerequisite: Graduate standing and consent of instructor
- **CSC 5572: Special Advanced Activity (1-2 units)**
  - Prerequisite: Consent of instructor
- **CSC 5666: Advanced Machine Learning (4 units)**
  - Prerequisite: DATA 4610 or CSC 4667
- **CSC 5820: Computational Linguistics (4 units)**
  - Prerequisite: CSC 4820
- **CSC 5870: Special Topics in Artificial Intelligence (4 units)**
  - Prerequisite: CSC 4880
- **CSC 5880: Artificial Intelligence (4 units)**
  - Prerequisite: CSC 4880
- **CSC 5887: Advanced Deep Learning (4 units)**
  - Prerequisite: CSC 4667 or DATA 4610
- **DATA 4720: Data Science Seminar (1 units)**
  - Prerequisite: DATA 3301
- **STAT 3820: Intermediate Statistical Computing with R (3 units)**
  - Prerequisites: STAT 1810; and STAT 1220 or STAT 3210 or STAT 3520
- **CSC 4891, CSC 4892, CSC 4893 and DATA 4720 can be taken for a combined total of up to 4 units.**

iv. total units required to complete the degree

120

v. if a master's degree, catalog copy describing the culminating experience requirement(s)

N/A

#### 4. Curriculum

(These requirements conform to the WSCUC 2013 Handbook of Accreditation)

a. These program proposal elements are required:

- Institutional learning outcomes (ILOs)
- Program learning outcomes (PLOs)
- Student learning outcomes (SLOs)

Describe outcomes for the 1) institution, 2) program and for 3) student learning. Institutional learning outcomes (ILOs) typically highlight the general knowledge, skills, and dispositions all students are expected to have upon graduating from an institution of higher learning. Program learning outcomes (PLOs) highlight the knowledge, skills, and dispositions students are expected to know as graduates from a specific program. PLOs are more narrowly focused than ILOs. Student learning outcomes (SLOs) clearly convey the specific and measurable knowledge, skills, and/or behaviors expected and guide the type of assessments to be used to determine if the desired the level of learning has been achieved. (WASC 2013 CFR: 1.1, 1.2, 2.3)

#### **Response:**

##### **Institutional (University) Learning Outcomes (ILOs)**

Graduates of an undergraduate program at Cal Poly should be able to:

1. Think critically and creatively
2. Communicate effectively
3. Demonstrate expertise in a scholarly discipline and understand that discipline in relation to the larger world of the arts, sciences, and technology
4. Work productively as individuals and in groups
5. Use their knowledge and skills to make a positive contribution to society
6. Make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability
7. Engage in lifelong learning

##### **Program Learning Outcomes (PLOs)**

Graduates of the B.S. Data Science program will have an ability to:

1. Analyze a complex data science problem and apply principles of statistics, computer science, mathematics, and a domain-specific field, such as health, engineering or application development, to identify data science- and data analysis-based approaches to solutions.
2. Design, implement, and evaluate a data-driven solution to meet a given set of analysis requirements.
3. Work with data of a wide range of volume, variety, velocity, and veracity.
4. Communicate data-driven insights effectively in a variety of professional contexts.
5. Attend to professional responsibilities and make informed judgments in data science practice based on legal and ethical principles.
6. Function effectively as a member or leader of a team engaged in activities appropriate to data science.

### **Student Learning Outcomes (SLOs)**

1. Through hands-on, project-based work, students will be able to apply interdisciplinary principles of computer science, statistics, mathematics, and data analytics to develop effective solutions to complex problems.
2. Students will be able to design and implement computational solutions that evaluate data-driven systems, algorithms, and workflows and meet specified analytical and performance requirements.
3. Students will be able to work effectively with diverse data, including acquiring, cleaning, manipulating, and integrating structured and unstructured data using modern tools and computational frameworks.
4. Students will be able to communicate data science- and data analysis-based solutions and data-driven insights to a variety of audiences.
5. Students will be able to recognize and address professional, legal, and ethical responsibilities in data science, including issues of privacy, bias, and societal impact.
6. Students will be able to function effectively as both members and leaders in collaborative, cross-disciplinary projects that integrate computing, statistical modeling, and domain knowledge.
7. Students will be able to use calculus, linear algebra, optimization, and probability to model, analyze, and interpret quantitative data in scientific and applied contexts.

b. These program proposal elements are required:

- [Comprehensive Assessment Plan](#) addressing all assessment elements
- [Matrix](#) showing where student learning outcomes are introduced (I), developed (D), and mastered (M)

Key to program planning is creating a comprehensive assessment plan addressing multiple elements, including a strategy and tool to assess each student learning outcome. SLOs operationalize the PLOs and serve as the basis for assessing student learning in the major. Constructing an assessment matrix, showing the relationship between all assessment elements, is an efficient and clear method of displaying all assessment plan components.

Creating a curriculum map matrix, identifying the student learning outcomes, the courses where they are found, and where content is “introduced,” “developed,” and “mastered” ensures that all student learning outcomes are directly related to overall program goals and

represented across the curriculum at the appropriate times. Assessment of outcomes is expected to be carried out systematically according to an established schedule, generally every five years.

**Response:**

**Comprehensive Assessment Plan for the B.S. Data Science**

The assessment plan ensures the continuous improvement of the B.S. Data Science program by evaluating student learning, program effectiveness, and alignment with institutional and program learning objectives. This plan establishes mechanisms for measuring student progress and program success through direct and indirect assessment strategies.

Please also see Appendix E: Curriculum Assessment Matrix and Appendix F: Program Assessment Plan.

**Our assessment plan is distributed across courses from CSC, MATH, STAT, and DATA. Please see Appendix F for a complete list of courses and their mapping to LOs.** See Appendix G for the list of all required courses mapped to the PLOs. Assessment will include **the following direct and indirect assessment measures:**

Direct Assessment Measures

- Course-Embedded Assignments: Assignments in DATA 3301 and STAT 3520 assess students' ability to analyze data. In-class discussion and reflection on sustainable resource utilization in DATA 3301 (as example of assessment of ILO 6).
- Exams and Quizzes: Core knowledge assessments in MATH 2621 and DATA 4610.
- Projects & Presentations: Group-based machine learning projects (DATA 4620) test collaboration and technical expertise.
- Capstone Projects: DATA 4460 requires students to complete a comprehensive team-based project demonstrating their ability to apply principles of statistics, computer science, and mathematics to the design, implementation, and evaluation of data-driven solutions to complex data science problems; their ability to work with data of a wide range of volume, variety, velocity, and veracity; their ability to work respectfully and productively in a diverse team; and their ability to communicate solution designs, data analyses, and the ethical and legal considerations in the design.

Indirect Assessment Measures

- Student Surveys: Exit surveys capture students' self-assessment of skills and preparation.
- Course Evaluations: Course feedback from students ideally helps improve instruction in individual courses; if leveraged more carefully it could also improve curricular design.
- Alumni and Employer Feedback: Surveys from alumni and industry partners will gauge recent program graduates' ability in the workplace to demonstrate attainment of the PLOs: 1) to analyze complex data science problems through the application of principles of statistics, computer science, and mathematics, 2) to design, implement, and evaluate data-driven solutions, 3) to work with data to derive meaningful insights, 4) to communicate effectively in professional settings, 5) to make informed, ethical decisions in data science practice, and 6) to collaborate effectively as both team members and leaders in data science-related projects.
- Job Placement and Graduate School Admission Rates: Track student outcomes post-graduation.

## Assessment Implementation Timeline

We will assess each PLO according to the following 5-year schedule:

Year	Activity
Year 1	Establish assessment committee; collect baseline data. Assess PLOs 1, 3
Year 2	Review curriculum mapping and student performance. Assess PLOs 2, 4
Year 3	Analyze trends and adjust instruction. Assess PLOs 5, 6, 1
Year 4	Gather alumni feedback and employer surveys. Assess PLOs 2, 3
Year 5	Comprehensive program review and updates. Assess PLOs 4, 5, 6

### Continuous Improvement Process

- Semi-annual faculty meetings to review assessment findings and plan iterative curriculum adjustments based on data.
- External peer reviews every seven years as per Cal Poly program review processes, following first program review to take place in Years 4-5 after launch.

### Final Notes

- Accreditation Compliance: The program aligns with WSCUC and adheres to CSU assessment policies.
- Faculty Development: Workshops and professional development to improve assessment practices.
- Resource Allocation: Periodic review of resources needed for program enhancement.

c. Indicate total number of units required for graduation.

### Response:

**120 units**

- d. Include a justification for any baccalaureate program that requires more than 120 semester units or 180 quarter units. Programs proposed at more than 120 semester units will have to provide either a Title 5 justification for the higher units or a campus-approved request for an exception to the Title 5 unit limit for this kind of baccalaureate program.

### Response:

N/A

- e. If any formal options, emphases or concentrations are planned under the proposed major, identify and list the required courses. Optional: You may propose a CSU degree program code and CIP code for each concentration that you would like to report separately from the major program.

### Response:

The BS Data Science program will include the following three concentrations. Required courses for each are listed above in Section 3.b.iii.

- Concentration in Mathematical Foundations
- Concentration in Statistical Modeling
- Concentration in Machine Learning Engineering

- f. List any new courses that are: (1) needed to initiate the program or (2) needed during the first two years after implementation. Include proposed catalog descriptions for new courses. For graduate program proposals, identify whether each new course would be at the graduate- or undergraduate-level.

**Response:**

DATA 2000: Orientation to the data science major and its concentrations, introduction to the discipline of data science, connections between data science and computer science, mathematics, and statistics, applications of data science in case studies. This is a new 1 credit hour seminar class that will be offered to sophomores. It will discuss the different subfields of data science and provide information relevant to picking a concentration.

- g. Attach a proposed course-offering plan for the first three years of program implementation, indicating likely faculty teaching assignments.  
(WASC 2013 CFR: 2.2b)

**Response:**

Please see Appendix H: Course Offering Plan for an outline of the courses, number of sections, and instructors for the first three years. Core courses are included, with concentrations separated and in bold. This is a multidisciplinary major, composed of nearly all existing courses; further details on the course offering patterns for each of those courses can be found in the [2026-28 university catalog](#).

- h. For master's degree proposals, include evidence that program requirements conform to the minimum requirements for the culminating experience, as specified in Section 40510 of Title 5 of the California Code of Regulations.

**Response:**

N/A

- i. For graduate degree proposals, cite the corresponding bachelor's program and specify whether it is (a) subject to accreditation and (b) currently accredited.  
(WASC 2013 CFR: 2.2b)

**Response:**

N/A

- j. For graduate degree programs, specify admission criteria, including any prerequisite coursework.  
(WASC 2013 CFR: 2.2b)

**Response:**

N/A

- k. For graduate degree programs, specify criteria for student continuation in the program.

**Response:**

N/A

- I. For undergraduate programs, specify planned provisions for articulation of the proposed major with community college programs.

**Response:**

As Data Science is an emerging discipline in higher education, there are relatively few established two-year Data Science programs in the California Community Colleges. There are several ways in which we can approach work with and articulation of CCC programs.

1. Community college A.S. degrees in Computer Science and Statistics share significant overlaps with the first two years of the B.S. Data Science Curriculum. After the program has been launched and is robust, we will work on establishing flowcharts that would allow students with CS or Statistics associate degrees from California community colleges to transfer into the B.S. Data Science program at Cal Poly. Our program will share C-IDs from Computer Science (CSC), Statistics (STAT), and Mathematics (MATH). For example, CSC C-IDs are CSC 1001 and CSC 2001. The lab components are not directly counted because the C-ID is only 3 semester units.

2. As community colleges pilot and enhance their Data Science programs, we will work on developing clear articulations of community college Data Science courses with Data Science courses offered at Cal Poly. Furthermore, Cal Poly is committed to working with transfer students and programs such as the CSU Transfer Success Pathways. We will continue to develop our relationships with nearby community colleges (Allan Hancock and Cuesta Community College) to explore the development of 2+2 curricula.

3. The annual National Workshop on Data Science Education (NWDSE) at UC Berkeley brings together UC, Cal State and CCC faculty for in-depth discussion of Data Science education. Some Cal Poly faculty are involved with the California Alliance for Data Science Education (CADSE) and actively participate in the work of NWDSE. We will use these to confer with administrators and faculty involved in Data Science education in California community colleges to develop a better understanding of the emerging trends in CCC Data Science education.

- m. Roadmaps. Provide a 4-year major and subprogram roadmap and a 2-year transfer roadmap for bachelor's degree programs or an appropriate year major roadmap for master's degree programs that outlines the suggested coursework students should complete each semester.

**Response:**

Please see Appendix I: Roadmaps

- n. Describe how accreditation requirements will be met, if applicable, and anticipated date of accreditation request (including the WASC Substantive Change process). (WASC 2013 CFR: 1.8)

**Accreditation Note:**

*Master's degree program proposals*

If subject to accreditation, establishment of a master's degree program should be preceded by national professional accreditation of the corresponding bachelor's degree program.

### *Fast-track proposals*

Fast-track proposals cannot be subject to specialized accreditation by an agency that is a member of the Association of Specialized and Professional Accreditors unless the proposed program is already offered as an authorized option, emphasis or concentration that is accredited by an appropriate specialized accrediting agency.

#### **Response:**

Other than the university accreditation by WSCUC, the proposed program will not be accredited by another agency. Substantive change screening with WSCUC has been completed. No review is required.

## **5. Societal and Public Need for the Proposed Degree Program**

- a. List other California State University campuses currently offering or projecting the proposed degree program; list neighboring institutions, public and private, currently offering the proposed degree program.

#### **Response:**

#### **CSU Campuses**

- California Polytechnic State University, San Luis Obispo – *Cross-Disciplinary Studies Minor in Data Science* (undergraduate minor) – A campus-wide minor offered through the Statistics and Computer Science and Software Engineering departments, building data-analysis and computing skills across domains [statistics.calpoly.edu](https://statistics.calpoly.edu).
- California Polytechnic State University, Pomona – *Minor in Data Science* – A minor open to all majors (through the CS department) focusing on programming, statistics, and data analysis fundamentals [cpp.edu](https://cpp.edu).
- CSU Long Beach – *Bachelor of Science in Applied Data Science* – An interdisciplinary data science major approved in 2024, designed to prepare graduates for data-intensive careers with strong programming, data analysis, and domain-application coursework [csulb.edu/csulb.edu](https://csulb.edu/csulb.edu).
- CSU East Bay (Hayward) – *Bachelor of Science in Statistics (Data Science Concentration)* – A B.S. in Statistics where students may concentrate in Data Science, emphasizing hands-on data analysis and computation (small class sizes) [csueastbay.edu](https://csueastbay.edu).
- CSU Sacramento – *Bachelor of Science in Statistics (Data Science Emphasis)* – A B.S. in Statistics that offers an emphasis in Data Science, focusing on professional data-analysis software and real-world datasets [csus.edu](https://csus.edu).
- San Diego State University (SDSU) – *Bachelor of Science in Statistics (Data Science Emphasis)* – A statistics degree with an optional emphasis in Data Science [math.sdsu.edu](https://math.sdsu.edu). This emphasis provides students with advanced data analytical and computational skills for large datasets (including additional CS and advanced stats courses).
- CSU Monterey Bay – *Bachelor of Science in Statistics and Data Science* – An integrated B.S. major combining statistics with data science methods [csumb.edu](https://csumb.edu). (Also: *Minor in Data Science* – a supplemental minor to deepen data science knowledge alongside any major [csumb.edu](https://csumb.edu).)
- Cal State Northridge (CSUN) – *Minor in Data Science* – An undergraduate minor (23–26 units) in the Computer Science department covering probability/statistics, algorithms, programming, data structures, and a capstone project in data science [catalog.csun.edu](https://catalog.csun.edu).
- Cal State San Bernardino (CSUSB) – *Minor in Data Science* – A 32-unit minor providing hands-on training in data science concepts and techniques, including statistical methodology and computing, open to students in any major [catalog.csusb.edu](https://catalog.csusb.edu).

- Cal State Maritime (CSU Monterey Bay) – *Minor in Data Science* – A newly introduced minor combining mathematics, statistics, and computer science for maritime and broader applications (e.g. machine learning for shipping, AI supply chains) [csum.edu](http://csum.edu).

### **Other California Institutions**

- UC Berkeley (public) – *Data Science, B.A.* – An interdisciplinary major (offered by the College of Computing, Data Science, and Society) that combines computation, statistics, and a chosen application domain. The program is highly flexible, allowing students to craft data science curricula that fit their goals [cdss.berkeley.edu](http://cdss.berkeley.edu).
- UC San Diego (public) – *Data Science, B.S.* – A Bachelor of Science major whose focus is training students in predictive modeling, data analysis, computational techniques, and the societal/ethical aspects of data science [catalog.ucsd.edu](http://catalog.ucsd.edu).
- UC Irvine (public) – *Data Science, B.S.* – A B.S. major integrating foundational statistics and computer science: first two years cover core stats and CS courses, then specialized topics (algorithms, machine learning, visualization, Bayesian stats, etc.), culminating in a year-long capstone project [catalogue.uci.edu](http://catalogue.uci.edu).
- UC Davis (public) – *Data Science, B.S.* – A new undergraduate program (launched Fall 2022) granting a B.S. in Data Science. It blends computer science, engineering, mathematics and statistics foundations, requiring both theoretical and applied coursework [ucdavis.edu](http://ucdavis.edu). (Students choose the “foundations” track, emphasizing the methodology and theory of data science.)
- UC Santa Barbara (public) – *Statistics and Data Science, B.S.* – A Bachelor of Science in Statistics with a special “Data Science” track. The department notes the B.S. in Statistics and Data Science provides extra preparation for the workforce and emphasizes rigorous quantitative skills [pstat.ucsb.edu](http://pstat.ucsb.edu).
- UC Riverside (public) – *Data Science, B.S.* – An interdisciplinary Data Science major jointly housed in the Computer Science & Engineering and Statistics departments, with a curriculum drawing from both disciplines and including breadth courses (e.g. biology, economics) [datascience.ucr.edu](http://datascience.ucr.edu). (Also: *Minor in Data Science* – available campus-wide for students in any major [datascience.ucr.edu](http://datascience.ucr.edu).)
- UC Merced (public) – *Data Science and Computing, B.S.* – A B.S. major that empowers undergraduates to apply data science methods across any scientific domain. Graduates gain core skills in computing, statistics, machine learning, ethics and communication [ucmerced.edu](http://ucmerced.edu). *Data Science and Analytics, B.A.* – A B.A. major combining data science with applied social sciences (economics, political science, management). It covers the full data-analytics pipeline (data integration, visualization, inference) and includes a team capstone project [ucmerced.edu](http://ucmerced.edu).
- Stanford University (private) – *Data Science, B.S.* – An interdisciplinary B.S. successor to Stanford’s MCS major, focusing on mathematical foundations of data science, computation, optimization, modeling and statistics. Students take courses in Stats, Math, CS, and Engineering Science, learning core theory and new methodologies [datasciencemajor.stanford.edu](http://datasciencemajor.stanford.edu). *Data Science & Social Systems, B.A.* – An interdisciplinary B.A. major integrating statistical/computational methods with deep domain knowledge in the social sciences. Students gain expertise in data methods, social science, and ethics through a core curriculum and specialized pathways [datasciencemajor.stanford.edu](http://datasciencemajor.stanford.edu).
- University of Southern California (private) – *Data Science, B.A.* – A cooperative Bachelor of Arts degree (joint between Dornsife and Viterbi schools). It combines computer-based information systems, statistics, and computing to address organizational and social challenges. The 128-unit

program requires rigorous CS and math courses along with a domain “specialization” in the Dornsife College [datascience.usc.edu](https://datascience.usc.edu).

- California Institute of Technology (private) – *Information and Data Sciences, B.S.* – An undergraduate major in Caltech’s Computing + Mathematical Sciences division. It treats “information and data sciences” as an interdisciplinary field spanning signal processing, algorithms, machine learning, etc. (Caltech has offered this major to train students in data acquisition, processing and analysis across domains [cms.caltech.edu](https://cms.caltech.edu).)
- Harvey Mudd College (private) – *Emphasis in Data Science* – A cross-disciplinary emphasis (not a separate degree) that students in science/engineering/math majors can add. It consists of a coordinated set of courses (e.g. CS, probability, statistics, capstone) to ensure students learn data-scientific approaches and ethics in their fields [hmc.edu](https://hmc.edu).
- University of San Francisco (private) – *Data Science, B.S.* – A Bachelor of Science program (BSDS) combining computing and data analysis. It leverages San Francisco’s tech environment to train students in statistics, machine learning, and data management for careers in the evolving AI/data-driven economy [usfca.edu](https://usfca.edu).

b. Describe differences between the proposed program and programs listed in Section 5a above.

**Response:**

The proposed BS in Data Science at Cal Poly San Luis Obispo distinguishes itself from existing programs in California through its breadth of interdisciplinary, career-focused concentrations and deep integration of mathematical, statistical, and engineering principles. While many current CSU and UC programs offer broad or single-track degrees in Data Science, Cal Poly’s proposed program is uniquely structured to support three distinct concentrations, allowing students to tailor their education toward specific professional or academic pathways.

Key differentiators include:

- A Mathematical Foundations concentration that provides a rigorous theoretical core, uncommon in most applied-focused programs.
- A specialized Statistical Modeling track, which emphasizes real-world impact and domain-specific data applications—an area not commonly offered as a full concentration elsewhere.
- An engineering-oriented option in Machine Learning Engineering which bridges the gap between data science theory and scalable, production-level implementation—this focus on engineering integration is particularly rare at the undergraduate level in California.

Overall, Cal Poly’s BS in Data Science stands out for its customizable and professionally aligned curriculum, blending technical depth with practical, interdisciplinary applications in a way few peer institutions currently match.

c. List other curricula currently offered by the campus that are closely related to the proposed program.

**Response:**

*Cross-Disciplinary Studies Minor in Data Science* (undergraduate minor) – A campus-wide minor offered through the Statistics and Computer Science and Software Engineering departments, building data-analysis and computing skills across domains ([statistics.calpoly.edu](https://statistics.calpoly.edu)).

- d. Describe community participation, if any, in the planning process. This may include prospective employers of graduates.

**Response:**

As part of the planning process for the proposed BS in Data Science, the proposers presented the degree structure and its three concentrations to the College of Engineering Industrial Advisory Board, which includes representatives from a range of technology, engineering, and analytics-focused companies. Advisory board members provided feedback on the relevance of the proposed concentrations to current industry needs, affirming the value of the specialized track in Machine Learning Engineering (and anticipated future tracks in Data Engineering and in Biomedical and Health Analytics). Their input helped validate the program’s alignment with workforce expectations and informed refinements to ensure graduates are well-prepared for diverse, data-intensive roles.

- e. Provide applicable workforce demand projections and other relevant data.

**Note:** *Data Sources for Demonstrating Evidence of Need*

[US Department of Labor, Bureau of Labor Statistics](https://www.bls.gov)

[California Labor Market Information](https://www.dir.ca.gov)

**Response:**

The proposed Bachelor of Science in Data Science at Cal Poly San Luis Obispo is well-aligned with robust national and state-level workforce trends indicating strong demand for data science professionals.

According to the U.S. Bureau of Labor Statistics (BLS), employment of data scientists is projected to grow 36% from 2023 to 2033, significantly faster than the average for all occupations. This growth is expected to result in approximately 20,800 job openings each year, driven by increased demand for data-driven decision-making across various industries.<sup>1</sup> According to the California Employment Development Department (EDD), employment of data scientists in California is projected to grow about 33% between 2022 and 2032, from 33,900 jobs to 45,000 jobs, resulting in roughly 3,440 annual job openings in the state.

The significant projected growth in data science roles underscores the relevance of Cal Poly’s proposed BS in Data Science. The program's diverse concentrations—including Machine Learning Engineering, Biomedical and Health Analytics, and Statistical Communication—are designed to equip graduates with specialized skills that meet the evolving needs of the data-driven workforce.<sup>2</sup>

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<sup>1</sup> [https://www.bls.gov/ooh/math/data-scientists.htm?utm\\_source=chatgpt.com](https://www.bls.gov/ooh/math/data-scientists.htm?utm_source=chatgpt.com).

<sup>2</sup> [https://www.bls.gov/news.release/archives/ecopro\\_09062023.pdf?utm\\_source=chatgpt.com](https://www.bls.gov/news.release/archives/ecopro_09062023.pdf?utm_source=chatgpt.com).

## 6. Student Demand

- a. Provide compelling evidence of student interest in enrolling in the proposed program. Types of evidence vary and may include national, statewide, and professional employment forecasts and surveys; petitions; lists of related associate degree programs at feeder community colleges; reports from community college transfer centers; and enrollments from feeder baccalaureate programs.

### **Response:**

Evidence of strong student interest in the proposed BS in Data Science at Cal Poly San Luis Obispo is supported by multiple indicators at the national, statewide, and institutional levels:

#### 1. Rising National and Statewide Interest in Data Science Careers

Nationally, data science is one of the fastest-growing fields, with the U.S. Bureau of Labor Statistics projecting a 36% increase in data scientist employment from 2023 to 2033—more than seven times the average job growth rate. In California, data-centric roles such as data scientists, machine learning engineers, and data engineers are consistently listed among the top emerging occupations according to the California Employment Development Department (EDD).

#### 2. Growing Enrollments and Inquiries in Related Cal Poly Programs

At Cal Poly, there is clear evidence of student interest in data science:

- The existing Cross-Disciplinary Studies Minor in Data Science, jointly offered by the Statistics and Computer Science and Software Engineering departments, consistently fills to capacity or near capacity each academic year (AY).
  - AY2025-2026: 27 students
  - AY2024-2025: 31 students
  - AY2023-2024: 21 students
  - AY2022-2023: 16 students
- Enrollment demand for related majors such as Computer Science, Software Engineering, Statistics, and Biomedical Engineering remains high, with competitive admissions thresholds indicating more interest than available capacity.
- Student clubs and organizations focused on data science, machine learning, and AI, such as CS+AI, have seen rapid membership growth in recent years, further demonstrating extracurricular engagement in this field.

#### 3. Community College Pipeline and Transfer Demand

Local California Community Colleges—such as Foothill College, Santa Monica College, and Diablo Valley College—have introduced Associate Degrees for Transfer (ADTs) in Computer Science as well as certificates in Data Science and Data Analytics, indicating a growing pipeline of students seeking to transfer into related bachelor's programs.

#### 4. Professional and Industry Validation

Feedback from Cal Poly’s College of Engineering Industrial Advisory Board affirmed that data science is a high-demand field with excellent job prospects, and board members expressed enthusiasm for a program that aligns students with emerging industry needs. This industry support reflects a perceived strong return on investment for students pursuing the major.

Together, these indicators point to a high level of student interest and demand for a BS in Data Science at Cal Poly, especially one offering career-relevant concentrations and interdisciplinary preparation.

- b. Identify how issues of diversity and access to the university were considered when planning this program. Describe what steps the program will take to ensure all prospective candidates have equitable access to the program. This description may include recruitment strategies and any other techniques to ensure a diverse and qualified candidate pool.

**Response:**

**1. Accessible Entry Points**

The program is designed to reduce early academic barriers that disproportionately affect underrepresented students. It will not require a separate application beyond university admission, and introductory data science courses will be open to students from all majors. These accessible entry points will allow students with varying levels of prior exposure to computing and statistics to explore the field and transition into the major.

The B.S. in Data Science shares one of its entry points – CSC 1001/CSC 1001L with the B.S. in Computer Science, B.S. in Software Engineering, and B.S. in Computer Engineering. These two courses are also required for B.S. in Statistics and B.S. in Mathematics. The B.S. in Data Science degree brings the demand for this course, and for the subsequent CSC 2002/CSC 2002L up by the estimated two extra sections/year. While this is a significant increase in demand, ***the B.S. in Data Science program will be part of the planned growth in the computing majors*** (i.e., majors overseen by the departments within the Noyce School of Applied Computing), and is accounted for by the additional hiring of tenure-track faculty and full-time lecturers the CSSE Department did over the past 3-4 years (and is projected to continue with). Historically, the predecessor course for CSC 1001/1001L, CSC 101 (a 4-unit course comprising a lecture and a lab component), *has not served as a weed-out course* in any of the disciplines that require it. The course assumes no prior knowledge of computer science or computing, and it introduces all necessary concepts within the course itself. The CSSE faculty responsible for developing CSC 1001/1001L are committed to ensuring that this accessibility persists into the semester version of the course.

The B.S. in Data Science shares early coursework in statistics (STAT 1510) with the B.S. in Statistics and early coursework in mathematics (MATH 1264) with options in the B.S. in Computer Science and the B.S. in Software Engineering. STAT 1510 introduces statistical reasoning through statistical investigations. MATH 1264 begins a calculus sequence focused on contextualizing calculus for data science to support those students pursuing computing majors. Each of these courses provides scaffolded experiences in the context of applications to reinforce the purpose and value of the material to those new to the discipline.

**2. Inclusive Curriculum and Representation**

The curriculum will address topics such as algorithmic bias, data bias, responsible AI practices, culturally informed research methodologies, data justice, ethics in data science, and the societal impact of data to emphasize the importance of diversity and social responsibility in the field. Faculty will incorporate real-

world examples and case studies that reflect diverse communities, helping students see the broader relevance of data science across different populations and industries.

### 3. Supportive Learning Environment

The program will leverage Cal Poly’s existing support structures—such as peer mentoring, academic learning communities, and student organizations focused on data science and inclusion—to create a strong sense of belonging. The program will also utilize CSU’s existing support and strategic initiatives, such as the CSU Student Success Framework. Faculty will also receive support in adopting inclusive teaching practices, particularly in foundational courses where equity gaps most commonly arise. Data science students will be incorporated into existing frameworks for internship opportunities across CSC, MATH, and STAT.

These elements work together to foster a data science program that is not only academically rigorous but also inclusive, accessible, and socially aware. We will integrate data science students into existing tutoring environments and across the three departments (CSC, STAT, MATH) adapting those tutoring and learning assistance programs to support these new students. Working with Strategic Enrollment Management, student clubs, and summer programs, such as EPIC, will be leveraged to connect with prospective students, especially from underrepresented backgrounds. For example, collaborations with K–12 educators and regional community colleges will help build an inclusive pipeline into the program. In addition, faculty, peer mentors, and student organizations will also play an active role in recruitment by serving as visible ambassadors of the program, highlighting diverse role models and pathways into data science.

- c. For master’s degree proposals, cite the number of declared undergraduate majors and the degree production over the preceding three years for the corresponding baccalaureate program, if there is one.

**Response:**

N/A

- d. Describe professional uses of the proposed degree program.

**Response:**

The proposed BS in Data Science at Cal Poly San Luis Obispo prepares students for a wide range of professional applications across industries where data-driven decision-making is critical. The program’s blend of mathematical, statistical, computational, and domain-specific skills enables graduates to contribute meaningfully in both technical and interdisciplinary roles.

Professional Uses of the Degree Include:

- **Technology and Software Development:**  
Graduates can work as data scientists, machine learning engineers, or data engineers in tech companies, developing algorithms, predictive models, and data infrastructure to support scalable, intelligent systems.

- **Healthcare and Biomedical Analytics:**  
The Data Science program prepares students in the skills necessary to analyze clinical, genomic, and public health data in roles such as clinical data analysts, biostatisticians, or health informatics specialists, supporting evidence-based care and innovation.
- **Business and Consulting:**  
With training in statistical modeling and communication, graduates are well-equipped for roles such as business analysts, data consultants, or market researchers, helping organizations interpret complex data and inform strategy.
- **Finance and Risk Analysis:**  
Data Science skills are increasingly essential in the finance sector for fraud detection, algorithmic trading, credit scoring, and risk modeling, supporting roles like quantitative analysts or data-driven financial consultants.
- **Government and Public Policy:**  
Data science professionals play a growing role in analyzing large-scale data for policy evaluation, public services optimization, and civic technology. Graduates may serve as data analysts or research specialists in government agencies or non-profits.
- **Scientific Research and Engineering:**  
The program also supports pathways into computational research, AI development, and data-intensive scientific domains, preparing students for roles in research labs or as technical staff in R&D environments.

With its multiple career-aligned concentrations, the BS in Data Science equips students not only with the technical expertise but also the collaborative and communication skills needed to thrive in complex, data-driven professional environments.

- e. Specify the expected number of majors in the initial year, and three years and five years thereafter. Specify the expected number of graduates in the initial year, and three years and five years thereafter.

**Response:**

Our plan is to admit FTFY cohorts of 24 for the first three years, then move to 48 FTFY in the 4th year and 72 in the 5th year. There will also be an opportunity for limited internal change of major. Please see the table below for projected data from years 1, 3, and 5.

	<b>At Initiation (2027-28)</b>	<b>After 3 Years (2029-30)</b>	<b>After 5 Years (2031-32)</b>
<b>Number of Majors (Annual)</b>	24	72	168
<b>Number of Graduates (Cumulative)</b>	-	5	48

**Note:** Sections 7 and 8 should be prepared in consultation with the campus administrators responsible for faculty staffing and instructional facilities allocation and planning. A statement from the responsible administrator(s) should be attached to the proposal assuring that such consultation has taken place.

## 7. Existing Support Resources for the Proposed Degree Program

- a. List faculty who would teach in the program, indicating rank, appointment status, highest degree earned, date and field of highest degree, professional experience, and affiliations with other campus programs. **Note:** For all proposed graduate degree programs, there must be a minimum of five full-time faculty members with the appropriate terminal degree. (Coded Memo EP&R 85-20)

**Response:**

Faculty Name	Rank and Appointment Status	Degree, Date, Field	Professional Experience	Affiliations with other Campus Programs
Paul Anderson	Professor	Ph.D., 2010, Computer Science and Engineering	10+ years teaching in CS and Data Science including curriculum development, Chair Data Science Curriculum Committee	Computer Science and Software Engineering (CSSE)
Alex Dekhtyar	Professor	Ph.D., 2000, Computer Science	25+ years teaching in CS and Data Science, co-founder of CDSM in Data Science, curriculum program development	CSSE
Foad Khosmood	Professor	Ph.D., 2011, Computer Science	15+ years teaching in Computer Science, Computer Engineering and Data Science, including curriculum development	CSSE, Computer Engineering (CPE)
Sumona Mukhopadhyay	Assistant Professor	Ph.D., 2018, Computer Science	5+ years teaching in computer Science and Data Science, including curriculum development	CSSE
Lubimir Stanchev	Professor	Ph.D., 2005, Computer Science	20+ years teaching in Computer Science and Data Science including curriculum and program development	CSSE
Jonathan Ventura	Associate Professor	Ph.D., 2012, Computer Science	12+ years teaching in Computer Science and	CSSE

			Data Science including curriculum development	
Kelly Bodwin	Associate Professor	Ph.D., 2017, Statistics	8+ years teaching Statistics and Data Science, including curriculum development	Statistics
Hunter Glanz	Professor	Ph.D., 2013, Statistics	10+ years teaching Statistics and Data Science including curriculum development	Statistics
Kevin Ross	Professor	Ph.D., 2006, Statistics	19+ years of teaching statistics and data science including curriculum development	Statistics
Allison Theobald	Assistant Professor	Ph.D., 2020, Statistics	6+ years teaching Statistics and Data Science	Statistics
Immanuel Williams	Assistant Professor	Ph.D., 2017, Education Psychometrics	8+ years teaching Statistics and Data Science	Statistics
Paul Choboter	Professor	Ph.D., 2002, Applied Mathematics	22+ years teaching mathematics and applied mathematics including curriculum development	Mathematics
Daniel Alejandro Cruz	Assistant Professor	Ph.D., 2019, Mathematics	12+ years teaching mathematics	Mathematics
Elena Dimitrova	Professor	Ph.D., 2006, Mathematics	20 years teaching mathematics including curriculum development	Mathematics

b. Describe facilities that would be used in support of the proposed program.

**Response:**

Current facilities in support of the BS in Data Science program include Rooms 38-122/122a - the Statistics computer lab and the side meeting room, which will be used for the Data Science Capstone (these spaces see current use for the DATA 451/452 and will continue being used in the same manner after the switch to semesters and the start of the BS in Data Science program). Additionally, several CSSE lab spaces, including but not limited to Rooms 14-301, 14-302, 20-127, 14-257, and 14-255, will be used for various CSC and DATA coursework that has a laboratory component.

Please also consult Appendix J: Strategic Enrollment Management Physical Space Assessment memorandum, from Joe Borzellino, Associate Vice President for Strategic Enrollment Management, dated October 8, 2025.

c. Provide evidence that the institution offers adequate access to both electronic and physical library and learning resources.

**Response:**

Cal Poly's Kennedy Library has just been reopened after a two-year renovation, and all BS in Data Science students will have physical access to it.

Cal Poly Library subscribes to the following publication databases and resources that will be relevant for the BS in Data Science program<sup>3</sup>:

- Digital Commons archives of faculty publications and graduate student theses
- ACM (Association for Computing Machinery) Digital Library
- Dissertations and Theses Global: The Sciences and Engineering Collection
- Dissertations and Theses Global: The Humanities and Social Sciences Collection
- Google Dataset Search
- Google Scholar
- IEEE/IIET Electronic Library
- JSTOR
- MathSciNet
- MIT Press Ebooks
- National Science Digital Library
- O'Reilly On-line Learning (formely – Safari books)
- Oxford Scholarship Online
- PubMed/PubMed Central
- Royal Society Digital Journal Archives
- SAGE Journals on-line
- SAGE Knowledge eBooks and eReference
- SpringerLink
- Statista
- Synthesis Digital Library of Engineering and Computer Science
- UNData
- Web of Science (all Databases)
- Web of Science (core Collection)

Combined with the free access to resources such as those listed below, the students in the BS in Data Science program will have sufficient library support at Cal Poly.

- The UCI Machine Learning Repository
- The Hugging Face
- Kaggle
- DBLP

Please also consult Appendix K: Library Support Memorandum provided by CENG Librarian Sarah Lester and BCSM Librarian Jeanine Scaramozzino, dated October 30, 2025.

d. Describe available academic technology, equipment, and other specialized materials.

**Response:**

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<sup>3</sup> <https://guides.lib.calpoly.edu/az/databases>

The CSSE department maintains a cluster of high-performance workstations in 20-127 (High-Performance Computing Lab) which runs a Jupyter Labs server that will be used in various required and tech elective courses for the BS in Data Science.

The Statistics department maintains a computer lab located in 38-122, which is furnished with 26+ workstations running a wide range of statistical packages (Jump, Minitab, RStudio) which are used in the STAT and DATA courses.

Cal Poly’s Digital Transformation Hub, now part of the Noyce School of Computing has resources to provide AWS-supported compute (small, medium, and large AWS servers) on-demand to meet the instructional needs of the Data Science capstone, as well as other DATA and CSC courses that require such support.

### 8. Additional Support Resources Required

**Note:** *If additional support resources will be needed to implement and maintain the program, a statement by the responsible administrator(s) should be attached to the proposal assuring that such resources will be provided.*

- a. Describe additional faculty or staff support positions needed to implement the proposed program.

**Response:**

This program can be supported for the next 3-5 years with existing faculty and depending upon enrollment demand. Future funding, if available or awarded, would be determined in conversations with the provost, deans and departments.

The following table includes a range of tenure-track, lecturer, and staff resources needed for program launch and after Years 3 and 5.

	<b>New Resources at Initiation</b>	<b>New Resources to Be Added After 3 Years</b>	<b>New Resources to Be Added After 5 Years</b>
<b>Tenure-Track Faculty (WTUs)</b>	0-2.0	0-6.0	0-2.0
	Pending enrollment, up to 2.0 CS/STATS/DATA	Pending enrollment, up to 6.0 CS/STATS/DATA	Pending enrollment, up to 2.0 CS/STATS/DATA
<b>Lecturers (WTUs)</b>	0	0	0
	Existing lecturers will be utilized to teach in the program or may be supported by other means or methods.	Existing lecturers will be utilized to teach in the program or may be supported by other means or methods.	Existing lecturers will be utilized to teach in the program or may be supported by other means or methods.
<b>Staff (FTE)</b>	0-1.0	0-2.0	0-1.0

	<b>New Resources at Initiation</b>	<b>New Resources to Be Added After 3 Years</b>	<b>New Resources to Be Added After 5 Years</b>
	Up to: Two Directors at 12 WTUs	IST Support Staff; Program Admin Support	Advisor
<b>Total Personnel Cost</b>	\$0-\$462,000 (\$352,000 Faculty Salary and Benefits; \$50,000 Faculty Start-Up Packages; \$60,000 Assigned Time for Directors)	\$0-\$1,414,000 (\$1,056,000 Faculty Salary and Benefits; \$150,000 Faculty Start-Up Packages); \$128,000 IST/Technician; \$80,000 Program Admin Support)	\$0-\$498,000 (\$352,000 Faculty Salary and Benefits; \$50,000 Faculty Start-Up Packages); \$96,000 for Advisor)

- b. Describe the amount of additional lecture and/or laboratory space required to initiate and to sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy. Major capital outlay construction projects are those projects whose total cost is \$610,000 or more (as adjusted pursuant to Cal. Pub. Cont. Code §§ 10705(a); 10105 and 10108).

**Response:**

Students from the program can be accommodated in existing sections of courses offered regularly by the Departments of Computer Science and Software Engineering, Mathematics, and Statistics. The exceptions are the following classes that will need additional lecture space: 1-2 sections of MATH 2621 and 1-2 sections of DATA 4460 (capstone). No special facilities are required.

- c. Include a report written in consultation with the campus librarian which indicates any necessary library resources not available through the CSU library system. Indicate the commitment of the campus to purchase these additional resources.

**Response:**

As previously described (and documented in Appendix K), the library currently has sufficient resources to support the program. Cal Poly's Kennedy Library currently subscribes to databases and resources that will be relevant for the BS Data Science program (listed in Section 7.c).

- d. Indicate additional academic technology, equipment, or specialized materials that will be (1) needed to implement the program, and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

**Response:**

Consistent with ongoing conversations with ITS, the Computer Science and Software Engineering Department and Noyce School of Applied Computing are working on securing infrastructure to support existing data science and computer science courses.

The following new resources will be needed at initiation:

1. **Dedicated High-Performance Jupyter Labs Server**
  - **Purpose:** Provides better performance for student labs and courses.
  - **Estimate:** \$20,000 - \$25,000 for an enhanced server setup with upgraded specs.
2. **Advanced Compute Servers with GPU Access (for ML Projects)**
  - **Purpose:** Allows for more complex machine learning and data science projects.
  - **Estimate:** \$15,000 - \$20,000 per server. For three servers: \$45,000 - \$60,000.
3. **Enhanced Storage Solution with Cloud Integration**
  - **Purpose:** Supports large datasets, provides cloud access for capstone projects.
  - **Estimate:** \$15,000 - \$20,000 for expanded storage with cloud compatibility.
4. **Server Space for Deploying Multiple DBMS Servers**
  - **Purpose:** Allows flexibility in running Oracle, Postgres, MongoDB, MemSQL for coursework.
  - **Estimate:** \$5,000 - \$10,000 for server setup and licenses.
5. **Dedicated Full-Time ITS Staff**
  - **Purpose:** Ensures smooth operation and maintenance of infrastructure.
  - **Estimate:** \$60,000 - \$70,000 for a full-time staff member.
6. **Capstone Project Cloud Budget**
  - **Purpose:** Provides additional resources specifically for capstone projects.
  - **Estimate:** \$5,000 - \$10,000 annually.

We project an annual total facilities and equipment cost of \$150,000 – \$190,000.

## 9. Self-Support Programs

- a. Confirm that the proposed program will not be offered at places or times likely to supplant or limit existing state-support programs.

**Response:**

N/A

- b. Explain how state-support funding is either unavailable or inappropriate.

**Response:**

N/A

- c. Explain how at least one of the following additional criteria shall be met:
  - i. The courses or program are primarily designed for career enrichment or retraining;
  - ii. The location of the courses or program is significantly removed from permanent, state-supported campus facilities;
  - iii. The course or program is offered through a distinct technology, such as online delivery;
  - iv. For new programs, the client group for the course or program receives educational or other services at a cost beyond what could be reasonably provided within CSU Operating Funds;

- v. For existing programs, there has been a cessation of non-state funding that previously provided for educational or other services costing beyond what could be reasonably provided within CSU Operating Funds.

**Response:**

N/A

- d. For self-support programs, please provide information on the per-unit cost to students and the total cost to complete the program (in addition to the required cost recovery budget elements listed in the CSU degree proposal faculty check list found earlier in this document and listed below):

**Response:**

N/A

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\* Basic Cost Recovery Budget Elements  
(Three to five year budget projection)

Student per-unit cost

Number of units producing revenue each academic year

Total cost a student will pay to complete the program

Revenue - (yearly projection over three years for a two-year program; five years for a four-year program)

Student fees

Include projected attrition numbers each year

Any additional revenue sources (e.g., grants)

Direct Expenses

Instructional costs – faculty salaries and benefits

Operational costs – (e.g., facility rental)

Extended Education costs – staff, recruitment, marketing, etc.

Technology development and ongoing support (online programs)

Indirect Expenses

Campus partners

Campus reimbursement general fund

Extended Education overhead

Chancellor’s Office overhead

\*Additional line items may be added based on program characteristics and needs.

**Submit completed proposal packages to:**

[degrees@calstate.edu](mailto:degrees@calstate.edu)

Academic Programs, Innovation and Faculty Development  
CSU Office of the Chancellor  
401 Golden Shore, 6<sup>th</sup> Floor  
Long Beach, CA 90802-4210

**Contact Us**

**Academic Programs, Innovation and Faculty Development**

Brent M. Foster, Ph.D.

Assistant Vice Chancellor and State University Dean, Academic Programs

Phone (562) 951-4149

[bfoster@calstate.edu](mailto:bfoster@calstate.edu)

Academic Programs, Innovation and Faculty Development is on the Web: <http://www.calstate.edu/APP/>

**Extended Education (Professional and International Education)**

Mr. Leo Van Cleve

Assistant Vice Chancellor, Professional and International Education

Phone (562) 951-4790

[lvancleve@calstate.edu](mailto:lvancleve@calstate.edu)



## MEMORANDUM OF UNDERSTANDING Data Science Program Structure

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The Cal Poly College of Engineering (CENG) and the Cal Poly Bailey College of Science and Mathematics (BCSM) have jointly proposed a BS degree in Data Science. If approved, the proposed degree program may be run by two co-directors, one from each college. The degree program will not be housed within an existing department but will instead be a free-standing program jointly owned by the Bailey College of Science and Mathematics and the College of Engineering. Students will apply to and enroll as BCSM students and the program will be affiliated with the Noyce School of Applied Computing, in a similar manner to the Statistics Department. If/as applicable, each director will report to their respective dean (one for each college) with dotted line reporting to the Director of the Noyce School of Applied Computing.

If/as applicable, the data science faculty co-directors will work together to plan course schedules, monitor enrollments, and advise students. The data science program will have a curriculum committee which manages curriculum, and which reports to the program leadership (i.e., director or/if as applicable, co-directors). Faculty members wishing to affiliate with the data science program will have MOUs that define how their workload is split between their home department and the data science program. Affiliated faculty will go through the RPT process in their tenure home department, and the MOU will define how input from the data science program directors is incorporated into the review process.

As student enrollment grows, the program may transition to full department status, pending established processes and policies, most likely beginning at the point in time in which faculty are hired to directly support the degree program curriculum. In the event that a data science department is established it will be housed within the Bailey College of Science and Mathematics and fully affiliated within the Noyce School of Applied Computing, analogous to the Statistics Department.

### Accepted and Agreed:

  
Amy Fleischer (Nov 19, 2024 12:04 PST) 11/19/2024

Amy Fleischer Date  
Dean, College of Engineering

  
Dean Wendt (Nov 19, 2024 12:08 PST) 11/19/2024

Dean Wendt Date  
Dean, Bailey College of Sciences and Mathematics

  
Cynthia Jackson-Elmoore 11/20/2024

Cynthia Jackson-Elmoore Date  
Provost and Executive Vice President for Academic Affairs



May 1, 2025

Re: New Program Proposal for the Bachelor of Science in Data Science

Dear Program Proposal Reviewers,

We are pleased to offer our enthusiastic support for the proposed Bachelor of Science in Data Science degree program, which is an interdisciplinary effort between the College of Engineering and the Bailey College of Science and Mathematics.


Building upon the two college's successful Cross-Disciplinary Studies Minor (CDSM) in Data Science, the proposed 120-unit Bachelor of Science in Data Science will produce graduates who possess the problem-formulation, statistical, computing, and decision-making skills to solve the world's most pressing problems, while advancing the exciting and fast-growing field of data science and analytics. Students will be equipped with the skills and qualifications necessary to pursue jobs as data scientists, data engineers, machine learning engineers, and data analysts in industry, academia, and government settings.

Importantly, the program has been designed to leverage existing courses, laboratories, and faculty expertise, ensuring efficient use of university resources. The program takes advantage of the involved colleges' and departments' experience of administering the CDSM in Data Science. A faculty program director will be appointed with assigned time support similar to that provided to program directors in other departments.


The addition of Bachelor of Science in Data Science degree program will significantly strengthen the academic offerings of the College of Engineering and the Baily College of Science and Mathematics and will further position the university as a leader in preparing students to tackle the technological challenges of tomorrow.

We strongly support this exciting new program and the opportunities it will provide for our students, faculty, and industry partners.


Sincerely,

  
Robert Crockett (May 7, 2025 12:49 PDT)

Robert Crockett  
Interim Dean, College of  
Engineering

  
Dean Wendt (May 7, 2025 12:53 PDT)

Dean Wendt  
Dean, Bailey College of  
Science & Mathematics

  
Christopher Lupo (May 8, 2025 16:18 PDT)

Christopher Lupo  
Director, Noyce School of  
Applied Computing

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**TO:** Professor Joyce Lin, Professor Zoe Wood  
**FROM:** Department of Mathematics Curriculum Committee  
**SUBJECT:** B.S. Data Science Statement of Support  
**DATE:** November 15, 2025

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The Mathematics Department Curriculum Committee strongly supports the proposed Bachelor of Science in Data Science. The program, along with the mathematics courses it includes, has been reviewed and approved by the committee. This interdisciplinary degree integrates mathematics, statistics, and computer science to provide students with strong analytical and computational skills applicable to real-world data challenges.

The program aligns with the mission of the Mathematics Department and builds on our existing strengths in quantitative education. It fosters collaboration among departments and offers valuable opportunities for students and faculty alike. We view the implementation of this degree as a positive and timely addition to Cal Poly and the CSU system, and we strongly support its approval.



Professor Emily Hamilton, Curriculum Committee Chair



## MEMORANDUM

**March 18, 2026**

**TO:** College of Engineering  
**FROM:** Department of Computer Science and Software Engineering Curriculum Committee  
**SUBJECT:** B.S. Data Science Statement of Support

---

The CSSE Curriculum Committee strongly supports the proposed Bachelor of Science in Data Science. The program and its curricular pathways have been reviewed and approved by the committee. This interdisciplinary degree integrates computer science, statistics, and mathematics to provide students with a strong foundation in programming, data analysis, machine learning, and data-driven problem solving. The curriculum is well structured, with a clear progression from core computing and quantitative skills to advanced topics and a culminating capstone experience.

The program's emphasis on applied learning, interdisciplinary collaboration, and ethical data practice supports the college's Learn by Doing mission, and its values of excellence, collaboration, and preparing students to make a positive societal impact. In addition, the program's topics of data ethics, justice, and bias are department and college priorities. The CSSE curriculum committee views this program as a timely and valuable addition that advances these shared missions and strongly supports its approval.

Assistant Professor April Grow, CSSE Curriculum Committee Chair

To: Professor Joyce Lin, Professor Zoe Wood

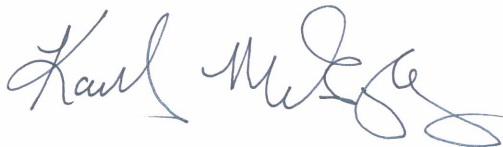
From: Department of Statistics Curriculum Committee

Subject: B.S. Data Science Statement of Support

Date: March 17, 2026

The Statistics Department Curriculum Committee strongly supports the proposed Bachelor of Science in Data Science. The program, along with the statistics courses it includes, has been reviewed and approved by the committee. This interdisciplinary degree integrates statistics, mathematics and computer science providing students with strong quantitative and computational skills preparing them for the real-world data challenges of today and tomorrow.

The BS in Data Science aligns with the mission of the Statistics Department and provides opportunities for collaboration among the participating departments. It also provides valuable opportunities for students and faculty. We view the implementation of this degree program as a positive step forward for Cal Poly and the CSU system. We strongly support the implementation of this degree program.

A handwritten signature in blue ink, appearing to read "Karen McGaughey". The signature is fluid and cursive, with a large, stylized initial "K".

Professor Karen McGaughey, Statistics Curriculum Committee Chair



**CAL POLY**

Bailey College of  
Science & Mathematics

**BCSM Curriculum Committee  
MEMORANDUM**

**03/19/2026**

**TO:** Dr. Paul Anderson and Data Science Affiliated Faculty  
**FROM:** Dr. Sandi Clement, Bailey College of Science & Mathematics Curriculum  
Committee Chair; Dr. Joyce Lin, Associate Dean, Bailey College of Science &  
Mathematics  
**COPIES:** Dr. Andrew Morris, Executive Director, Academic Programs and Planning  
**SUBJECT:** **B.S. Data Science – Statement of Support**

---

The Bailey College Curriculum Committee strongly supports the BS in Data Science. The program, as well as each course, has been reviewed and approved by the committee. The degree program offers a comprehensive curriculum with an emphasis in real world applications, with appropriate specializations that will benefit students in multiple disciplines and colleges. Students graduating with an BS in Data Science from Cal Poly State University, San Luis Obispo, will be prepared to contribute immediately upon entering the workforce.

The BS in Data Science provides an opportunity for both faculty and undergraduates to engage in cutting-edge curriculum that will enhance the offerings of Cal Poly, creating more opportunities for collaboration and contribution within university and beyond. We see the implementation of this degree program as a mechanism for growth while strengthening Cal Poly's capacity for research in artificial intelligence, big data analytics, and computational modeling. We strongly support the implementation of this degree program.

Sandi Clement (Mar 19, 2026 14:04:03 PDT)

Sandi Clement, BCSM Curriculum Chair

Joyce Lin (Mar 19, 2026 14:05:51 PDT)

Joyce Lin, Associate Dean, BCSM



## MEMORANDUM

March 18, 2026

**TO:** College of Engineering  
**FROM:** College of Engineering Curriculum Committee  
**SUBJECT:** B.S. Data Science Statement of Support

---

The CSSE Curriculum Committee has no objections to the proposed Bachelor of Science in Data Science. The program and its curricular pathways have been reviewed by the committee. This interdisciplinary degree integrates computer science, statistics, and mathematics to provide students with a strong foundation in programming, data analysis, machine learning, and data-driven problem solving. The curriculum is well structured, with a clear progression from core computing and quantitative skills to advanced topics and a culminating capstone experience.

The program's emphasis on applied learning and interdisciplinary collaboration supports the college's Learn by Doing mission, and its values of excellence, collaboration, and preparing students to make a positive societal impact.

**Signature:** *Bruce DeBruhl*

**Email:** bdebruhl@calpoly.edu

*Bruce DeBruhl*

Bruce DeBruhl  
Professor, Computer Science and Software Engineering  
Professor, Computer Engineering  
Chair, College of Engineering Curriculum Committee




# Memo\_CENG\_CC\_DataScience(1)

Final Audit Report

2026-04-01

Created:	2026-04-01
By:	Bruce DeBruhl (bdebruhl@calpoly.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAAjZYOkFLaODXwm5etC2dctOPVdZ0VYLCQ

## "Memo\_CENG\_CC\_DataScience(1)" History

-  Document created by Bruce DeBruhl (bdebruhl@calpoly.edu)  
2026-04-01 - 5:47:07 PM GMT- IP address: 129.65.145.222
-  Document e-signed by Bruce DeBruhl (bdebruhl@calpoly.edu)  
Signature Date: 2026-04-01 - 5:47:20 PM GMT - Time Source: server- IP address: 129.65.145.222
-  Agreement completed.  
2026-04-01 - 5:47:20 PM GMT

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**From:** John Hausaman <jhausaman@wscuc.org>  
**Sent:** Wednesday, April 2, 2025 8:45 AM  
**To:** Daniel Grassian <grassian@calpoly.edu>  
**Subject:** Substantive Change New Program Request Determination



Dear ALO:

Thank you for submitting the Substantive Change New Program Request. Following a review of the information submitted, it has been determined that no substantive change review will be necessary for the proposed program.

**Program Implementation Notification Required**

You are required to confirm implementation of the program in order for the program or location to be listed on the WSCUC website for purposes of financial aid eligibility verification by the U.S. Department of Education.

*Login to the [Accreditation Management Portal](#) and the Data Science as Active within 30 days of implementation. Failure to report implementation may result in the suspension of financial aid eligibility for enrolled students.*

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P - prerequisite	I - introduced
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SLO 1: Through hands-on, project-based work, students will be able to apply interdisciplinary principles of computer science, statistics, mathematics, and data analytics to develop effective solutions to complex problems.

SLO 2: Students will be able to design and implement computational solutions that evaluate data-driven systems, algorithms, and workflows and meet specified analytical and performance requirements.

**Core**

CSC 1001	P - prerequisite	P - prerequisite
CSC 1001L	P - prerequisite	P - prerequisite
CSC 2001	P - prerequisite	P - prerequisite
CSC 2001L	P - prerequisite	P - prerequisite
DATA 2000	I - introduced	I - introduced
STAT 1510	P - prerequisite	P - prerequisite
STAT 2610	I - introduced	I - introduced
STAT 3520	I - introduced	I - introduced
STAT 3530	D - developed	D - developed
MATH 1264	P - prerequisite	P - prerequisite
MATH 1265	P - prerequisite	P - prerequisite
MATH 1151	P - prerequisite	P - prerequisite
MATH 2031	P - prerequisite	P - prerequisite
MATH 2621	I - introduced	I - introduced
DATA 3301	D - developed	D - developed
DATA 4610	D - developed	D - developed
DATA 4620	M - mastered	M - mastered
DATA 4401	M - mastered	M - mastered
DATA 4460	M - mastered	M - mastered

PHIL 3322  
 PHIL 3323  
 PHIL 3327

**Mathematical Foundations**

MATH 2343	P - prerequisite	P - prerequisite
MATH 3055	I - introduced	I - introduced
MATH 3152	D - developed	I - introduced
MATH 3351	D - developed	D - developed

MATH 3622	D - developed	D - developed
MATH 3651	M - mastered	D - developed
MATH 4653	M - mastered	M - mastered

**Statistical Modeling**

STAT 1810	I - introduced	I - introduced
STAT 3820	D - developed	D - developed
STAT 4740	M - mastered	D - developed
STAT 4750	M - mastered	M - mastered
STAT 4760	M - mastered	M - mastered
STAT 4770	M - mastered	M - mastered
STAT 4780	M - mastered	M - mastered
STAT 4790	M - mastered	M - mastered
STAT 5550	M - mastered	M - mastered

**Machine Learning Engineering**

STAT 1810	I - introduced	I - introduced
DATA 3302		
CSC 3449	I - introduced	I - introduced
CSC 3665	D - developed	D - developed
CSC 3660	D - developed	D - developed
CSC 3662	D - developed	D - developed
CSC 4820	M - mastered	M - mastered
CSC 4880	D - developed	D - developed
CSC 4881	D - developed	D - developed
CSC 4888	M - mastered	M - mastered
CSC 4891	D - developed	D - developed
CSC 4892	D - developed	D - developed
CSC 4893	D - developed	D - developed
CSC 5571	D - developed	D - developed
CSC 5572	D - developed	D - developed
CSC 5666	M - mastered	M - mastered
CSC 5820	M - mastered	M - mastered
CSC 5870	D - developed	D - developed
CSC 5880	D - developed	D - developed
CSC 5887	M - mastered	M - mastered
DATA 4632	M - mastered	M - mastered
DATA 4720	I - intermediate	I - intermediate

MATH 2343	P - prerequisite	P - prerequisite
MATH 3152	I - introduced	I - introduced
MATH 3351	D - developed	D - developed
MATH 3622	D - developed	D - developed
MATH 3651	M - mastered	D - developed
MATH 4653	M - mastered	M - mastered
STAT 3820	D - developed	D - developed
STAT 4610	M - mastered	D - developed
STAT 4740	M - mastered	D - developed
STAT 4750	M - mastered	M - mastered
STAT 4760	M - mastered	M - mastered
STAT 4770	M - mastered	M - mastered
STAT 4780	M - mastered	M - mastered
STAT 4790	M - mastered	M - mastered
STAT 5530	M - mastered	M - mastered
STAT 5550	M - mastered	M - mastered

D - developed

M - mastered

SLO 3: Students will be able to work effectively with diverse data, including acquiring, cleaning, manipulating, and integrating structured and unstructured data using modern tools and computational frameworks.

SLO 4: Students will be able to communicate data science- and data analysis-based solutions and data-driven insights to a variety of audiences.

SLO 5: Students will be able to recognize and address professional, legal, and ethical responsibilities in data science, including issues of privacy, bias, and societal impact.

P - prerequisite

P - prerequisite

P - prerequisite

P - prerequisite

I - introduced

I - introduced

I - introduced

I - introduced

I - introduced

D - developed

P - prerequisite

D - developed

D - developed

I - introduced

D - developed

D - developed

M - mastered

D - developed

D - developed

M - mastered

D - developed

D - developed

M - mastered

M - mastered

M - mastered

D - developed

M - mastered

D - developed

M - mastered

D - developed

M - mastered

P - prerequisite

P - prerequisite

P - prerequisite

I - introduced

D - developed	I - introduced
D - developed	
M - mastered	

I - introduced	I - introduced	I - introduced
D - developed		
D - developed		I - introduced
M - mastered		I - introduced
M - mastered		
M - mastered		
M - mastered		
M - mastered		
M - mastered		

I - introduced	I - introduced	I - introduced
D - developed	D - developed	
P - prerequisite		
D - developed		
D - developed		
D - developed		
M - mastered		
D - developed		I - introduced
D - developed		I - introduced
M - mastered		
D - developed		
D - developed		
D - developed		
D - developed		
D - developed		
M - mastered	D - developed	
M - mastered		
D - developed		
D - developed	D - developed	I - introduced
M - mastered	D - developed	I - introduced
M - mastered	I - introduced	
	I - introduced	

P - prerequisite  
P - prerequisite  
I - introduced  
D - developed  
D - developed  
M - mastered  
D - developed  
D - developed  
D - developed  
M - mastered  
M - mastered  
M - mastered  
M - mastered  
M - mastered  
M - mastered  
M - mastered

I - introduced

SLO 6: Students will be able to function effectively as both a members and leaders in collaborative, cross-disciplinary projects that integrate computing, statistical modeling, and domain knowledge.

SLO 7: Students will be able to use calculus, linear algebra, optimization, and probability to model, analyze, and interpret quantitative data in scientific and applied contexts.

I - introduced	I - introduced
	I - introduced
	D - developed
	P - prerequisite
	P - prerequisite
	P - prerequisite
	I - introduced
D - developed	D - developed
D - developed	D - developed
D - developed	M - mastered
D - developed	M - mastered
M - mastered	M - mastered

I - introduced
I - introduced
D - developed
D - developed

I - introduced

D - developed

M - mastered

M - mastered

I - introduced

D - developed

M - mastered

M - mastered

M - mastered

M - mastered

M - mastered

M - mastered

M - mastered

D - developed

I - introduced

I - introduced

I - introduced



## BS Data Science Degree Proposal – Comprehensive Assessment Plan

**NOTES:**

- In column D, courses named assess both PLO and SLO indicated in each row.
- In columns D through K, assessment mapping from each course listed addresses both PLOs in column B and SLOs in column C. However, given Cal Poly’s assessment focus on PLOs rather than SLOs, we have included classes in column D that especially map to the relevant PLO.

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
1: Think critically and creatively	3: Work with data of a wide range of volume, variety, velocity, and veracity.	3: Students will be able to work effectively with diverse data, including acquiring, cleaning, manipulating, and integrating structured and unstructured data using modern tools and computational frameworks.	STAT 1510 STAT 3520 STAT 3540 DATA 4620 DATA 4401 DATA 4460 MATH 4653 STAT 4750 STAT 4760 STAT 4770 STAT 4780 STAT 4790 STAT 5550 STAT 3540 STAT 4366 CSC 4820 CSC 4888 CSC 5666 CSC 5820 CSC 5887	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate school admissions rates will be recorded.	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be tabulated over time to determine trends.	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees’ analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course readings and/or assessment methods

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
			DATA 4632 CSC 5660 DATA 4632							
2: Communicate effectively	4: Communicate data-driven insights effectively in a variety of professional contexts.	4: Students will be able to communicate data science- and data analysis-based solutions and data-driven insights to a variety of audiences.	STAT 1510 STAT 3520 STAT 3540 DATA 4460 STAT 4366	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate school admissions rates will be recorded.	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be tabulated over time to determine trends.	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course readings and/or assessment methods
3: Demonstrate expertise in a scholarly discipline and understand that discipline in relation to the larger world of the	1: Analyze a complex data science problem and apply principles of statistics, computer science, mathematics, and a domain-	1: Through hands-on, project-based work, students will be able to apply interdisciplinary principles of computer science, statistics, mathematics, and data	STAT 1510 STAT 3520 STAT 3540 DATA 4620 DATA 4401 DATA 4460 MATH 3651 MATH 4653 STAT 4740 STAT 4750	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
arts, sciences, and technology	specific field, such as health, engineering or application development, to identify data science- and data analysis-based approaches to solutions.	analytics to develop effective solutions to complex problems.	STAT 4760 STAT 4770 STAT 4780 STAT 4790 STAT 5550 STAT 3540 STAT 4366 CSC 4448 CSC 4820 CSC 4888 CSC 5666 CSC 5820 CSC 5887 DATA 4632 CSC 5660 CSC 5669 DATA 4632 CSC 5100		school admissions rates will be recorded.		tabulated over time to determine trends.			readings and/or assessment methods
4: Work productively as individuals and in groups	6: Function effectively as a member or leader of a team engaged in activities appropriate to data science.	6: Students will be able to function effectively as both members and leaders in collaborative, cross-disciplinary projects that integrate computing,	DATA 4460, CSC 2001L, DATA 4401	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
		statistical modeling, and domain knowledge.			school admissions rates will be recorded.		tabulated over time to determine trends.			readings and/or assessment methods
5: Use their knowledge and skills to make a positive contribution to society	2: Design, implement, and evaluate a data-driven solution to meet a given set of analysis requirements.	2: Students will be able to design and implement computational solutions that evaluate data-driven systems, algorithms, and workflows and meet specified analytical and performance requirements.	STAT 1510 STAT 3520 STAT 3540 DATA 4620 DATA 4401 DATA 4460 MATH 4653 STAT 4750 STAT 4760 STAT 4770 STAT 4780 STAT 4790 STAT 5550 STAT 3540 STAT 4366 CSC 4448 CSC 4820 CSC 4888 CSC 5666 CSC 5820 CSC 5887 DATA 4632 CSC 5660 CSC 5669 DATA 4632	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate school admissions rates will be recorded.	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be tabulated over time to determine trends.	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course readings and/or assessment methods

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
			CSC 5100							
6: Make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability	5: Attend to professional responsibilities and make informed judgments in data science practice based on legal and ethical principles.	5: Students will be able to recognize and address professional, legal, and ethical responsibilities in data science, including issues of privacy, bias, and societal impact.	DATA 4401, DATA 4460, DATA 4610, DATA 4620	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate school admissions rates will be recorded.	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be tabulated over time to determine trends.	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course readings and/or assessment methods
7: Engage in lifelong learning	1: Analyze a complex data science problem and apply principles of statistics, computer science, mathematics, and a domain-specific field, such as health,	7: Students will be able to use calculus, linear algebra, optimization, and probability to model, analyze, and interpret quantitative data in scientific and applied contexts.	STAT 1510, DATA 3301, DATA 4610, DATA 4460	Quizzes and/or exams, course-embedded assignments; projects and presentations; capstone projects.	Exit student surveys and alumni and employer feedback will be given a 1-5 scale of satisfaction. Data from course assignments, course evaluations, and job placement and graduate school admissions	Information will be gathered each year for a five year cycle.	Exit survey alumni and employer feedback, course evaluations, job placement, graduate school admissions, course assignments and capstone project results will be tabulated over	DS major - specific assessment committees to collect, interpret, and analyze; DS faculty to review and implement changes	Fall semester following data collection	Share assessment committees' analysis and interpretation with DS faculty to collaboratively develop relevant strategies, which might include revising course readings and/or

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
<i>ILOs</i>	<i>PLOs</i>	<i>SLOs</i>	<i>Course(s) where each SLO assessed</i>	<i>Assessment activity/ assignment to measure each SLO</i>	<i>Assessment tool used to measure outcome success</i>	<i>Assessment schedule</i>	<i>How data/ findings will be quantitatively or qualitatively reported</i>	<i>Designated personnel</i>	<i>Program data/ findings dissemination schedule</i>	<i>Closing the loop strategies</i>
	engineering or application development, to identify data science- and data analysis-based approaches to solutions.				rates will be recorded.		time to determine trends.			assessment methods

Examples of assessment activities: final exam, presentation, project, performance, observations, classroom response systems, computer simulated tasks, analytical paper, case study, portfolio, critique, policy paper, comparative analysis project, qualifying or comprehensive examination, project, thesis, dissertation, and many others.

Examples of Assessment Tools (an instrument used to score or evaluate an assessment activity/assignment): Rubrics (that produce scores based on established criteria – can be used with most activities listed above), observational checklists, etc.

Examples of ways to report assessment data: number/percentage of those scoring at or above 4.0 on a 5.0 point scale on the assessment used to measure mastery of a specific SLO; number/percentage of students scoring at the highly proficient level; instructor observational narrative that includes analysis and findings to qualitatively show trends and patterns; mean scores of all who exhibited desired traits or behaviors on an observational checklist. Other examples?

P - prerequisite	B - beginning
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PLO 1: Analyze a complex data science problem and apply principles of statistics, computer science, mathematics, and a domain-specific field, such as health, engineering or application development, to identify data science- and data analysis-based approaches to solutions.

PLO 2: Design, implement, and evaluate a data-driven solution to meet a given set of analysis requirements.

**Core**

CSC 1001	P - prerequisite	P - prerequisite
CSC 1001L	P - prerequisite	P - prerequisite
CSC 2001	P - prerequisite	P - prerequisite
CSC 2001L	P - prerequisite	P - prerequisite
DATA 2000	B - beginning	B - beginning
STAT 1510	P - prerequisite	P - prerequisite
STAT 2610	B - beginning	B - beginning
STAT 3520	B - beginning	B - beginning
STAT 3530	I - intermediate	I - intermediate
MATH 1264	P - prerequisite	P - prerequisite
MATH 1265	P - prerequisite	P - prerequisite
MATH 1151	P - prerequisite	P - prerequisite
MATH 2031	P - prerequisite	P - prerequisite
MATH 2621	B - beginning	B - beginning
DATA 3301	I - intermediate	I - intermediate
DATA 4610	I - intermediate	I - intermediate
DATA 4620	A - advanced	A - advanced
DATA 4401	A - advanced	A - advanced
DATA 4460	A - advanced	A - advanced

PHIL 3322  
 PHIL 3323  
 PHIL 3327

**Mathematical Foundations**

MATH 2343	P - prerequisite	P - prerequisite
MATH 3055	B - beginning	B - beginning
MATH 3152	I - intermediate	B - beginning
MATH 3351	I - intermediate	I - intermediate
MATH 3622	I - intermediate	I - intermediate
MATH 3651	A - advanced	I - intermediate

MATH 4653	A - advanced	A - advanced
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**Statistical Modeling**

STAT 1810	P - prerequisite	P - prerequisite
STAT 3820	I - intermediate	I - intermediate
STAT 4740	A - advanced	I - intermediate
STAT 4750	A - advanced	A - advanced
STAT 4760	A - advanced	A - advanced
STAT 4770	A - advanced	A - advanced
STAT 4780	A - advanced	A - advanced
STAT 4790	A - advanced	A - advanced
STAT 5550	A - advanced	A - advanced

**Machine Learning Engineering**

STAT 1810	B - beginning	B - beginning
DATA 3302		
CSC 3449	B - beginning	B - beginning
CSC 3665	I - intermediate	I - intermediate
CSC 3660	I - intermediate	I - intermediate
CSC 3662	I - intermediate	I - intermediate
CSC 4820	A - advanced	A - advanced
CSC 4880	I - intermediate	I - intermediate
CSC 4881	I - intermediate	I - intermediate
CSC 4888	A - advanced	A - advanced
CSC 4891	I - intermediate	I - intermediate
CSC 4892	I - intermediate	I - intermediate
CSC 4893	I - intermediate	I - intermediate
CSC 5571	I - intermediate	I - intermediate
CSC 5572	I - intermediate	I - intermediate
CSC 5666	A - advanced	A - advanced
CSC 5820	A - advanced	A - advanced
CSC 5870	I - intermediate	I - intermediate
CSC 5880	I - intermediate	I - intermediate
CSC 5887	A - advanced	A - advanced
DATA 4632	A - advanced	A - advanced
DATA 4720	I - intermediate	I - intermediate
MATH 2343	P - prerequisite	P - prerequisite
MATH 3152	B - beginning	B - beginning
MATH 3351	I - intermediate	I - intermediate
MATH 3622	I - intermediate	I - intermediate

MATH 3651	A - advanced	I - intermediate
MATH 4653	A - advanced	A - advanced
STAT 3820	I - intermediate	I - intermediate
STAT 4610	A - advanced	I - intermediate
STAT 4740	A - advanced	I - intermediate
STAT 4750	A - advanced	A - advanced
STAT 4760	A - advanced	A - advanced
STAT 4470	A - advanced	A - advanced
STAT 4480	A - advanced	A - advanced
STAT 4790	A - advanced	A - advanced
STAT 5530	A - advanced	A - advanced
STAT 5550	A - advanced	A - advanced

I - intermediate

A - advanced

PLO 3: Work with data of a wide range of volume, variety, velocity, and veracity.

PLO 4: Communicate data-driven insights effectively in a variety of professional contexts.

PLO 5: Attend to professional responsibilities and make informed judgments in data science practice based on legal and ethical principles.

P - prerequisite

P - prerequisite

P - prerequisite

P - prerequisite

B - beginning

B - beginning

B - beginning

B - beginning

B - beginning

I - intermediate

P - prerequisite

I - intermediate

I - intermediate

B - beginning

I - intermediate

I - intermediate

A - advanced

I - intermediate

I - intermediate

A - advanced

I - intermediate

I - intermediate

A - advanced

A - advanced

A - advanced

I - intermediate

A - advanced

I - intermediate

A - advanced

I - intermediate

A - advanced

P - prerequisite

P - prerequisite

P - prerequisite

B - beginning

I - intermediate

B - beginning

I - intermediate

A - advanced

B - beginning	B - beginning	B - beginning
I - intermediate		
I - intermediate		B - beginning
A - advanced		B - beginning
A - advanced		
A - advanced		
A - advanced		
A - advanced		
A - advanced		

B - beginning	B - beginning	B - beginning
I - intermediate	I - intermediate	
P - prerequisite		
I - intermediate		
I - intermediate		
I - intermediate		
A - advanced		
I - intermediate		B - beginning
I - intermediate		B - beginning
A - advanced		
I - intermediate		
I - intermediate		
I - intermediate		
I - intermediate		
I - intermediate		
A - advanced	I - intermediate	
A - advanced		
I - intermediate		
I - intermediate	I - intermediate	B - beginning
A - advanced	I - intermediate	B - beginning
A - advanced	B - beginning	
	B - beginning	
P - prerequisite		
P - prerequisite		
B - beginning		
I - intermediate	B - beginning	

I - intermediate

A - advanced

I - intermediate

I - intermediate

I - intermediate

A - advanced

A - advanced

A - advanced

A - advanced

A - advanced

A - advanced

A - advanced

PLO 6: Function effectively as a member or leader of a team engaged in activities appropriate to data science.

I - intermediate

B - beginning

I - intermediate

I - intermediate

I - intermediate

I - intermediate

A - advanced

B - beginning

I - intermediate

B - beginning

B - beginning

B - beginning

## BS Data Science: Data Engineering

<b>1st Year - AY 2027-28</b>					
<b>Fall</b>	<b>Sections</b>	<b>Instructor</b>	<b>Spring</b>	<b>Sections</b>	<b>Instructor</b>
STAT 1510	1	Ross	CSC 2001	1	Philbrick
CSC 1001	1	Siu	CSC 2001L	1	Philbrick
CSC 1001L	1	Siu	MATH 1265	1	Dimitrova
MATH 1264	1	Dimitrova	STAT 3520	1	Bodwin
<b>Semester Total</b>	<b>4</b>		<b>Semester Total</b>	<b>4</b>	

<b>2nd Year - AY 2028-29</b>					
<b>Fall</b>	<b>Sections</b>	<b>Instructor</b>	<b>Spring</b>	<b>Sections</b>	<b>Instructor</b>
STAT 1510	1	Ross	CSC 2001	1	Philbrick
CSC 1001	1	Siu	CSC 2001L	1	Philbrick
CSC 1001L	1	Siu	MATH 1265	1	Dimitrova
MATH 1264	1	Dimitrova	STAT 3520	1	Bodwin
MATH 1151	1	Choboter	DATA 3301	1	Anderson
DATA 2000	1	Dekhlyar	MATH 2621	1	Dimitrova
STAT 2610	1	Glanz	STAT 1810 (B,C)	1	Glanz
			STAT 3530	1	Williams
			MATH 2343 (A)	1	Choboter
<b>Semester Total</b>	<b>7</b>		<b>Semester Total</b>	<b>8</b>	

<b>3rd Year AY 2029-30</b>					
<b>Fall</b>	<b>Sections</b>	<b>Instructor</b>	<b>Spring</b>	<b>Sections</b>	<b>Instructor</b>
STAT 1510	1	Ross	CSC 2001	1	Philbrick
CSC 1001	1	Siu	CSC 2001L	1	Philbrick
CSC 1001L	1	Siu	MATH 1265	1	Dimitrova
MATH 1264	1	Dimitrova	STAT 3520	1	Bodwin
MATH 1151	1	Choboter	DATA 3301	1	Anderson
DATA 2000	1	Dekhlyar	MATH 2621	1	Dimitrova
STAT 2610	1	Glanz	STAT 1810 (B,C)	1	Glanz
MATH 2031 (A)	1	Choboter	STAT 3530	1	Williams
MATH 3351 (A)	1	Dimitrova	MATH 2343 (A)	1	Choboter
STAT 3820 (B)	1	Glanz	MATH 2031 (B,C)	1	Choboter
DATA 3302 (C)	1	Wright	CSC 3449 (C)	1	Migler
DATA 4610	1	Stanchev	MATH 3152 (A)	1	Choboter
			DATA 4620	1	Ventura
<b>Semester Total</b>	<b>12</b>		<b>Semester Total</b>	<b>13</b>	

**Concentrations are noted thusly:**

(A) Mathematical Foundations

(B) Statistical Modeling

(C) Machine Learning Engineering

<b>BS Data Science: Mathematical Foundations</b>					
<b>Advising Roadmap – Recommended Course Sequence</b>					
<b>Freshman Year (28 units)</b>					
Fall	Units			Spring	Units
STAT 1510	3			CSC 2001	3
GE (1A)	3			CSC 2001L	1
MATH 1264 (2)	4			GE (1B)	3
CSC 1001	3			MATH 1265	4
CSC 1001L	1			STAT 3520	3
<b>Total:</b>	<b>14</b>			<b>Total:</b>	<b>14</b>
<b>Sophomore Year (31 units)</b>					
Fall	Units			Spring	Units
MATH 1151	3			DATA 3301	4
GE (3B)	3			MATH 2621	3
DATA 2000	1			<b>MATH 2343</b>	<b>3</b>
STAT 2610	3			GE (1C)	3
GE (5B)	3			STAT 3530	4
GE (5C)	1				
<b>Total:</b>	<b>14</b>			<b>Total:</b>	<b>17</b>
<b>Junior Year (33 units)</b>					
Fall	Units			Spring	Units
DATA 4610	4			DATA 4620	4
MATH 2031	3			GE (5A)	3
<b>MATH 3351 (U2)</b>	<b>3</b>			<b>MATH 3152</b>	<b>4</b>
GE (6)	3			GE (4A)	3
Ethics Elective (U3)	3			GE (4B)	3
<b>Total:</b>	<b>16</b>			<b>Total:</b>	<b>17</b>
<b>Senior Year (28 units)</b>					
Fall	Units			Spring	Units
DATA 4401	4			DATA 4460	2
<b>MATH 3622</b>	<b>3</b>			<b>MATH 4653</b>	<b>3</b>
<b>MATH 3651</b>	<b>3</b>			GE (U4)	3
GE (3A)	3			<b>Elective</b>	<b>2</b>
<b>Elective</b>	<b>2</b>			<b>MATH 3055</b>	<b>3</b>
<b>Total:</b>	<b>15</b>			<b>Total:</b>	<b>13</b>
				<b>Total Units:</b>	<b>120</b>



## MEMORANDUM

10/8/25

**TO:** Paul Anderson, Professor, Department of Computer Science and Software Engineering  
**FROM:** Joe Borzellino, Associate Vice President for Strategic Enrollment Management  
**SUBJECT:** Physical Space assessment of Bachelor of Science degree in Data Science proposal

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The following is a brief physical space assessment for the proposed Bachelor of Science degree in Data Science. This assessment is based on information provided by Paul Anderson of the Department of Computer Science and Software Engineering and has been reviewed by the scheduling office of the University Registrar.

### **Classroom/Lab Space:**

1. The proposal indicates that the Bachelor of Science in Data Science program is a residential degree program that will serve a portion of the planned enrollment growth of the majors within the Noyce School of Computing. The proposal envisions, at full build-out, a major with 192-480 active students, depending on admitted cohort size.

### **Office Space:**

1. Office space needs were not assessed, as that responsibility lies within Academic Affairs.

**Summary:** Estimates provided by the proposers indicate the non-GE impact on university classroom space to be approximately four additional sections of existing courses per term, one additional section of an existing course per year, and up to two additional sections of new courses per year. These estimates appear reasonable given the planned initial cohort sizes. GE space needs would be addressed through overall enrollment growth planning.

The Office of the Registrar has indicated that this proposal will not significantly burden university classroom resources although there is some uncertainty regarding the campus-wide impact on university classroom space due to semester conversion. The Registrar also notes that any future activity or laboratory offerings are expected to be offered in department- or college-controlled spaces.



## MEMORANDUM

10/30/2025

TO:

FROM: Sarah Lester, College of Engineering Librarian and Jeanine Scaramozzino, Philip and Christina Bailey College of Science and Mathematics (BCSM) Librarian

COPIES: Nikki DeMotive, Senior Manager of Collections Strategy & Discovery  
Katherine O'Clair, Associate Dean for Academic Services  
Adriana Popescu, Dean, Library Services

SUBJECT: Library resources in support of proposed BS in Data Science

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Kennedy Library's current collection can fully support the proposed BS in Data Science. As there is much overlap with existing courses, the library already provides access to content that supports Computer Engineering instruction and research. Detailed below is a selection of the relevant resources.

### Description of Collections Supporting Data Science

#### Books and Journals

Kennedy Library has long preferred online books and journals for engineering. The libraries online collection includes access to journals from top publishers of engineering information including IEEE, ACM, Elsevier, Springer Nature, and numerous others. These online resources include highly ranked journals as well as access to books and technical handbooks.

*Online journal and ebook collections include:*

#### **ACM Digital Library**

ACM Digital Library covers the fields of computing and information technology. The full-text database includes the complete collection of ACM's publications, including journals, conference proceedings, magazines, newsletters, and multimedia titles.

#### **IEEE Xplore (IEEE/IET Electronic Library)**

The IEEE/IET Electronic Library provides access to full-text documents from publications in electrical engineering, computer science, telecommunications, electronics and related disciplines, including journals, ebooks, standards, and conference proceedings from the Institute of Electrical and Electronics Engineers (IEEE), the Institution of Engineering and Technology (IET), John Wiley & Sons, and MIT Press.

#### **SpringerLink**

SpringerLink hosts thousands of high quality peer-reviewed journals and e-books in the



natural sciences, medicine, engineering, business & economics, social sciences, architecture, food & nutrition, and environmental sciences.

### **ScienceDirect**

ScienceDirect is Elsevier's platform for ebooks and peer-reviewed journals in the areas of physical sciences and engineering, life sciences, health sciences, and social sciences and humanities.

### **Synthesis Digital Library of Engineering and Computer Science**

Synthesis features 50- to 100-page e-books that synthesize important research or development topics across a broad range of engineering and computer science areas. More modular and dynamic than traditional print or digital handbooks, they are ideal entry points to new areas for researchers, advanced developers, and students.

### **O'Reilly Online Learning**

O'Reilly Online Learning provides access to professional books on topics including UX design, leadership, project management, teams, agile development, analytics, and core programming. In addition to ebooks, learning paths, case studies, and video courses are available.

## **Research Databases**

### **Compendex (Engineering Village)**

Compendex is a comprehensive bibliographic database of scientific and technical engineering research, covering all engineering disciplines. It includes millions of bibliographic citations and abstracts from thousands of engineering journals and conference proceedings.

### **Inspec (Engineering Village)**

Inspec is a comprehensive index to global literature in electronics, computer science, physics, electrical, control, production and mechanical engineering. Includes INSPEC Thesaurus, Classification Codes and other specialized search aids.

### **Dissertations & Theses Global: The Sciences and Engineering Collection**

A comprehensive collection of dissertations and theses in the fields of science and engineering.

### **Web of Science**

Web of Science (Core Collection) provides a single search across Arts & Humanities Citation Index, Science Citation Index, and Social Sciences Citation Index. Additional Web of Science databases are easily accessible.



## Research and Instructional Support

In addition to the collection resources provided by the library. The College of Engineering Librarian maintains a [Computer Science and Engineering Research Guide](#) and the BCSM Librarian maintains a guide on [Mathematics and Statistics](#), both provide pointers to relevant databases and resources. The library's primary search tool, OneSearch is useful in helping students identify relevant books and resources in the collection. Students and faculty can get personal help from their College Librarian via email, in person, or over Zoom depending on preferences and availability. The library provides 24/7 Live Chat supported by well-trained students and librarians. Faculty can also request library research instruction sessions with their College Librarian.

Wednesday, April 15, 2026 at 6:27:18 AM Pacific Daylight Time

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**Asunto:** ASCC Approval of DATA-BS and Concentrations

**Fecha:** miércoles, 15 de abril de 2026, 3:45:47 a.m. hora de verano del Pacífico

**De:** John H. Walker

**A:** Paul E. Anderson, Aaron Keen, Andrew A. Schaffner, Benjamin P. Richert

**CC:** Jerusha Greenwood, Shannon Sullivan-Danser, Andrew D. Morris, Catalog

Hi, all,

The Academic Senate Curriculum Committee has reviewed and approved the BS in Data Science and its concentrations.

- Mathematical Foundations
- Statistical Modeling
- Machine Learning.

Please add this e-mail to the appropriate appendix of the proposal as evidence of our approval.

Sincerely,  
John

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John H. Walker, Ph.D.  
Professor, Statistics Department  
Chair, Academic Senate Curriculum Committee  
California Polytechnic State University  
San Luis Obispo, CA, USA  
Pronouns: he/him/his