

# STAT 140B: STATISTICAL LEARNING

---

## In Workflow

1. MATH Committee Chair (vincent.pigno@csus.edu)
2. MATH Chair (kelce@skymail.csus.edu)
3. NSM College Committee Chair (mikkel.jensen@csus.edu)
4. NSM Dean (datwyler@csus.edu)
5. Academic Services (catalog@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (gardner@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (catalog@csus.edu)
10. Registrar's Office (k.mcfarland@csus.edu)
11. PeopleSoft (PeopleSoft@csus.edu)

## Approval Path

1. Fri, 29 Sep 2023 03:49:21 GMT  
Vincent Pigno (vincent.pigno): Approved for MATH Committee Chair
2. Fri, 29 Sep 2023 16:34:15 GMT  
Kimberly Elce (kelce): Approved for MATH Chair
3. Wed, 04 Oct 2023 22:57:09 GMT  
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Wed, 04 Oct 2023 23:03:58 GMT  
Shannon Datwyler (datwyler): Approved for NSM Dean
5. Mon, 30 Oct 2023 20:23:55 GMT  
Katie Hawke (katiedickson): Approved for Academic Services

## New Course Proposal

Date Submitted: Thu, 28 Sep 2023 23:54:45 GMT

**Viewing: STAT 140B : Statistical Learning**

**Last edit: Wed, 04 Oct 2023 22:56:59 GMT**

Changes proposed by: Clark Fitzgerald (223005263)

**Contact(s):**

Name (First Last)	Email	Phone 999-999-9999
Clark Fitzgerald	fitzgerald@csus.edu	916-278-4748

**Catalog Title:**

Statistical Learning

**Class Schedule Title:**

Statistical Learning

**Academic Group: (College)**

NSM - Natural Sciences & Mathematics

**Academic Organization: (Department)**

Mathematics & Statistics

**Will this course be offered through the College of Continuing Education (CCE)?**

No

**Catalog Year Effective:**

Fall 2024 (2024/2025 Catalog)

**Subject Area: (prefix)**

STAT - Statistics

**Catalog Number: (course number)**

140B

**Course ID: (For administrative use only.)**

TBD

**Units:**

3

**Is the only purpose of this change to update the term typically offered or the enforcement of existing prerequisites at registration?**

No

**In what term(s) will this course typically be offered?**

Spring term only

**Does this course require a room for its final exam?**

Yes, final exam requires a room

**Does this course replace an existing experimental course?**

Yes

**This course replaces the following experimental course:**

STAT 196M - Introduction to Statistical Learning

**This course complies with the credit hour policy:**

Yes

**Justification for course proposal:**

This course will be required for the new statistics BS program. Statistical learning is becoming a standard class in statistics departments. It fills a gap in our current statistics offerings and provides students with the opportunity to learn modern methods in data science.

**Course Description: (Not to exceed 80 words and language should conform to catalog copy.)**

Practical statistical modeling of data using professional-grade software. Principles, methodologies, and applications of supervised techniques such as classification, resampling, model selection, nonlinear regression, and tree-based methods. Unsupervised techniques including clustering and dimension reduction.

**Are one or more field trips required with this course?**

No

**Fee Course?**

No

**Is this course designated as Service Learning?**

No

**Is this course designated as Curricular Community Engaged Learning?**

No

**Does this course require safety training?**

No

**Does this course require personal protective equipment (PPE)?**

No

**Does this course have prerequisites?**

Yes

**Prerequisite:**

Stat 140A

**Prerequisites Enforced at Registration?**

Yes

**Does this course have corequisites?**

No

**Graded:**

Letter

**Approval required for enrollment?**

No Approval Required

**Course Component(s) and Classification(s):**

Lecture

**Lecture Classification**

CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

**Lecture Units**

3

**Is this a paired course?**

No

**Is this course crosslisted?**

No

**Can this course be repeated for credit?**

No

**Can the course be taken for credit more than once during the same term?**

No

**Description of the Expected Learning Outcomes and Assessment Strategies:**

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Apply machine learning methods by selecting parameters and fitting models.	Homework, project(s), midterm exams, final exam
2	Create and interpret prediction intervals for new data using existing models.	Homework, project(s), midterm exams, final exam
3	Select appropriate supervised and unsupervised machine learning techniques given a dataset and research goal.	Homework, project(s), midterm exams, final exam
4	Evaluate model performance using standard methods such as cross validation and simulation.	Homework, project(s), midterm exams, final exam
5	Communicate results and justify methodology to a general audience.	Homework, project(s), midterm exams, final exam
6	Apply methodology to real world data using a high-level programming language such as R, Python, or Julia.	Homework, project(s), midterm exams, final exam

**Attach a list of the required/recommended course readings and activities:**

Stat 140B recommended course readings activities.pdf

**For whom is this course being developed?**

Majors in the Dept

**Is this course required in a degree program (major, minor, graduate degree, certificate?)**

Yes

**Has a corresponding Program Change been submitted to Workflow?**

Yes

**Identify the program(s) in which this course is required:**

**Programs:**  
BS in Statistics

**Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?**

No

**Will there be any departments affected by this proposed course?**

No

**I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.**

I/we agree

## **University Learning Goals**

**Undergraduate Learning Goals:**

Competence in the disciplines  
Intellectual and practical skills

**Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

## **GE Course and GE Goal(s)**

**Is this a General Education (GE) course or is it being considered for GE?**

No

**Please attach any additional files not requested above:**

stat140B-syllabus.pdf

Key: 15012