CSC 183: FOUNDATIONS OF LARGE LANGUAGE MODELS

In Workflow

1. CSC Committee Chair (abeer.abdelkhaleq@csus.edu)
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Approval Path

1. 2026-10-09T14:50:07Z
   Abeer Abdel Khaleq (abeer.abdelkhaleq): Approved for CSC Committee Chair
2. 2026-10-09T17:11:03Z
   Jinsong Ouyang (jouyang): Approved for CSC Chair
3. 2026-10-23T16:19:09Z
   Tongren Zhu (tongren.zhu): Approved for ECS College Committee Chair
4. 2026-10-23T16:20:51Z
   Behnam Arad (arad): Approved for ECS Dean

New Course Proposal

Date Submitted: 2026-10-09T00:42:03Z

Viewing: CSC 183 : Foundations of Large Language Models

Last edit: 2026-10-09T17:10:58Z

Changes proposed by: Bonaventure Molokwu (223029495)

Contact(s):

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Bonaventure Chidube Molokwu	bonaventure.molokwu@csus.edu	916-278-5490

Catalog Title:
Foundations of Large Language Models

Class Schedule Title:
Foundations of LLMs

Academic Group: (College)
ECS - Engineering & Computer Science

Academic Organization: (Department)
Computer Science

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2027 (2027/2028 Catalog)

Subject Area: (prefix)
CSC - Computer Science

Catalog Number: (course number)
183

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 requisites at registration?
No

In what term(s) will this course typically be offered?
Fall, Spring, Summer

Does this course require a room for its final exam?
Yes, final exam requires a room

Does this course replace an existing experimental course?
No

This course complies with the credit hour policy:
Yes

Justification for course proposal:
Current computing curricula often treat LLMs as closed or opaque systems, teaching only fundamental API interactions. This course bridges that gap by equipping students with the systems-level engineering and theoretical skills to build, pre-train, post-train, and fine-tune Transformers as well as LLMs; thereby transforming students into AI architects ready to meet urgent workforce demands.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)
Introduction to Transformer Neural Networks (TNNs), their architectural variants, and their role as the foundation for Large Language Models (LLMs). Topics include Language-AI terminology, regular expressions, static embedding methodologies, text tokenization approaches for TNNs, and LLM decoding strategies for next-token prediction. This course also covers building, pre-training, post-training, and fine-tuning both Representation and Generative Transformers.

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:
CSC 136, MATH 35 or MATH 100, and not currently enrolled in CSC 183

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):
Discussion

Discussion Classification
CS#02 - Lecture/Discussion (K-factor=1WTU per unit)
Discussion 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 regular expressions and Language-AI terminology.	Assignment 1
2	Illustrate words using static embeddings such as FastText.	Assignment 1, Midterm Exam
3	Compare and differentiate between Transformer Neural Network (TNN) architectures.	Assignment 2, Midterm Exam
4	Design and implement tokenization strategies for text preprocessing.	Assignment 2, Project
5	Identify and apply LLM decoding strategies during next-token prediction.	Assignment 3, Midterm Exam
6	Design, implement, and evaluate a Representation Transformer as well as a Generative Transformer.	Assignment 3, Project, Final Exam
7	Extend Representation Transformers and Generative Transformers for downstream task by post-training.	Assignment 4, Project, Final Exam

Attach a list of the required/recommended course readings and activities:
CSC183_CSUS.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?)
No

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
Integrative learning

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

Is this a General Education (GE) or Graduation Requirement (GR) course or is it being considered for GE/GR?

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

No

Please attach any additional files not requested above:

CSC183_ABET.pdf

Key: 15650