MATH 248: LIE THEORY

In Workflow

1. MATH Committee Chair (taylorlm@csus.edu)
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9. Catalog Editor (catalog@csus.edu)
10. Registrar's Office (wlindsey@csus.edu)
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Approval Path

1. Fri, 14 Oct 2022 23:51:53 GMT
   Lisa Taylor (taylorlm): Approved for MATH Committee Chair
2. Fri, 14 Oct 2022 23:53:57 GMT
   Kimberly Elce (kelce): Approved for MATH Chair
3. Wed, 19 Oct 2022 22:15:27 GMT
   Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Fri, 21 Oct 2022 20:33:34 GMT
   Shannon Datwyler (datwyler): Approved for NSM Dean

New Course Proposal

Date Submitted: Fri, 14 Oct 2022 23:51:22 GMT

Viewing: MATH 248 : Lie Theory

Last edit: Wed, 19 Oct 2022 22:15:13 GMT

Changes proposed by: Lisa Taylor (101035034)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Lisa Taylor	taylorlm@csus.edu	916-278-7075

Catalog Title:

Lie Theory

Class Schedule Title:

Lie Theory

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 2023 (2023/2024 Catalog)

Subject Area: (prefix)

MATH - Mathematics

Catalog Number: (course number)

248

Course ID: (For administrative use only.)
203536

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

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

This course complies with the credit hour policy:
Yes

Justification for course proposal:
This course will be an additional elective for the M.A. in Mathematics program, and was previously offered as Math 296C. Currently there are few one-semester electives for students in the graduate program and this course will expand the elective options.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)
Introduction to Lie algebras, Lie groups, and their connection. Emphasis is placed on examples given by matrices. Representation theory of Lie algebras or groups. Additional topics may include: applications to physics, the Baker-Campbell-Hausdorff Formula, one-parameter subgroups, root systems, the structure and classification of simple Lie algebras, and the topology of Lie groups.

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:
Math 110A and Math 130A, or consent of instructor.

Prerequisites Enforced at Registration?
No

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

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

Seminar Classification
CS#05 - Seminar (K-factor=1 WTU per unit)
Seminar 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	articulate and explain the basic concepts and ideas behind Lie theory, and in particular the structures of Lie algebras, Lie groups, and the relationships between them;	Homework Examinations (midterm and comprehensive final) A variety of reading and problem-solving assignments
2	elucidate the meaning of various Lie theory definitions using examples, typically surrounding fundamental sets of matrices that are important throughout mathematics and physics;	Homework Examinations (midterm and comprehensive final) A variety of reading and problem-solving assignments
3	demonstrate their fluency in the language and logic of Lie theory by applying subject-appropriate algebraic or analytic proof writing techniques;	Homework Examinations (midterm and comprehensive final) A variety of reading and problem-solving assignments
4	solve problems and carry out calculations of Lie-theoretical nature, especially with examples involving matrices; and	Homework Examinations (midterm and comprehensive final) A variety of reading and problem-solving assignments
5	apply the theory developed surrounding Lie algebras and groups to similar and more general structures.	Homework Examinations (midterm and comprehensive final) A variety of reading and problem-solving assignments

Attach a list of the required/recommended course readings and activities:
Math 248 recommended course readings activities 2022 10-12.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

Graduate (Masters) Learning Goals:
Critical thinking/analysis
Disciplinary knowledge

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 Graduate Writing Intensive (GWI) course?
No

Please attach any additional files not requested above:
Math 248 Syllabus approved 2022 10-12.pdf

Key: 14835