Instructor: Slobodan Simić
Office: 318A MacQuarrie Hall
Phone: (408) 924-7485
Email: simic@math.sjsu.edu or slobodan.simic@sjsu.edu
Web: http://www.math.sjsu.edu/~simic/Spring13/Math213A/213A.html
Office hours: MW 10:30-12:00, by appointment and every day on Piazza


Prerequisite: Math 113 or 132 or 175 (with a grade of "C-" or better) or instructor consent

Homework: There will be regular homework assignments mostly based on the textbook. I will grade three problems from each set but will provide solutions to most problems.

Exams: None.

Class paper: Each student will be required to write a short survey paper on a topic of his or her choice related to the course. Papers need to be typeset in \LaTeX.

Presentation: Each student will be required to present her/his survey paper at the end of the semester. Presentations will be 20 minutes long with 5 minutes for questions.

Grading policy: Homework 50%, Paper 30%, Presentation 20%


Course objectives: The main goal of the course is for students to acquire solid understanding of the basic results and techniques of calculus on manifolds. More specifically, a student should be able to:

- Define the notion of a smooth manifold and provide some fundamental examples.
- Define the notion of the tangent bundle.
- Define the notion of a smooth map between smooth manifolds.
- Differentiate a smooth map between manifolds and compute the local representation of its derivative in a given set of local coordinates.
• Explain how the notions of a smooth manifold, smooth map between manifolds, and the derivative 
generalize the analogous notions for surfaces in 3-space.
• Classify a given smooth map into an immersion, submersion or an embedding (or none of the 
above).
• Define the notion of a submanifold and provide some fundamental examples.
• Define the notion of a Lie group and provide fundamental examples.
• State and prove the Whitney embedding theorem for compact manifolds.
• Define and give several basic examples of actions of Lie groups.
• Define the notion of a differential form.
• Prove the Poincare lemma for differential forms.
• Compute the exterior differential of any given differential form.
• Define the integral of a differential form over a submanifold.
• Define the notion of a flow.
• State and outline the proof of the existence and uniqueness theorem for solutions of ordinary 
differential equations.
• Calculate the flow of linear and simple nonlinear vector fields and be able to analyze its asymptotic 
behavior.

**Participation:** During class please feel free to stop me at any time and ask questions. I encourage 
and greatly appreciate students’ participation.

**Feedback:** I appreciate constructive feedback which you can give me via the anonymous feedback 
form on the class web page, by email, or in person.

**Academic integrity:** From the Office of Student Conduct and Ethical Development: Your own 
commitment to learning, as evidenced by your enrollment at San José State University, and the Universitys Academic Integrity Policy, require you to be honest in all your academic course 
work. Faculty are required to report all infractions to the Office of Student Conduct and 
Ethical Development. The policy on academic integrity can be found at 
[http://sa.sjsu.edu/student_conduct](http://sa.sjsu.edu/student_conduct).

**Campus policy in compliance with the Americans with Disabilities Act:** If you need course 
adaptations or accommodations because of a disability, or if you need special arrangements in 
case the building must be evacuated, please make an appointment with your instructors as 
soon as possible, or see them during office hours. Presidential Directive 97-03 requires that 
students with disabilities register with DRC to establish a record of their disability.

**Class attendance:** According to University policy F69-24, Students should attend all meetings of 
their classes, not only because they are responsible for material discussed therein, but because 
active participation is frequently essential to insure maximum benefit for all members of the 
class. Attendance per se shall not be used as a criterion for grading.

For more details, see the course web page.