

MAT 771: Differential Geometry

Spring 2018

Instructor: Will Wylie, Carnegie 206C, email: wwylie@syr.edu

Lecture: Carnegie 110, MoWe 12:45-2:05.

Office Hours: Mo 3:45-4:45, We 10-12, or by appointment. I have an open door policy for quick/short questions.

Text: M. P. Do Carmo, *Riemannian Geometry*, (Translated by Francis Flaherty) , Birkhauser, 1992.

Prerequisites: **MAT 602** (Functions of several variables), **MAT 661** (Point Set Topology), a strong background in linear algebra and multi-variable calculus.

Course Material: The course will cover elements of the theory of abstract smooth manifolds with emphasis on Riemannian Geometry. This will cover topics contained in Chapter 0-8 of the text.

Homework: There will be homework assignments assigned bi-weekly. Four problems from each assignment will be collected and graded. Each solution will be graded as either complete or incomplete. If a solution is graded as incomplete, you may re-do and hand in the assignment as many times as you'd like until it is complete. You are encouraged to work together on the homework assignments.

Grading: Course grade will be based on completion of the homework assignments. Completing at least 75% of the homework problems will be a grade of A, 50% will be a grade of A-, less than 50% and regular class participation/attendance will be a grade of B+.

Students with disabilities: If you believe that you need academic adjustments (accommodations) for a disability, please contact the Office of Disability Services (ODS), located in Room 309 of 804 University Avenue, visit the ODS website- <http://disabilityservices.syr.edu>, or call (315) 443-4498 or TDD: (315) 443-1371 for an appointment to discuss your needs and the process for requesting academic adjustments. ODS is responsible for coordinating disability-related academic adjustments and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since academic adjustments may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. My goal is to create learning environments that are useable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, I invite any student to meet with me to discuss additional strategies beyond academic adjustments that may be helpful to your success.

Religious observances policy: Syracuse University's Religious Observances Policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to

their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they **notify their instructors no later than the end of the second week of classes** for regular session classes and by the submission deadline for flexibly formatted classes. Student deadlines are posted in MySlice under Student Services/Enrollment/My Religious Observances/Add a Notification.

Academic integrity: Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. <http://academicintegrity.syr.edu>.

The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

Copying homework solutions from any source, including the Internet, is plagiarism and is considered a violation.

Ally Statement: I have participated in the safer spaces training program through the LGBT center at Syracuse University. Please let me know if you use a different name than the one that shows up on my roster, and also let me know the pronouns that you use. I strive to use gender-neutral language in the classroom (e.g. your classmate, singular they), but I have old habits and I am not always successful. Feel free to correct me if I make a mistake.

Additional References:

Smooth Manifolds:

- J. Lee, *Introduction to smooth manifolds*, Springer.
- M. Spivak, *A comprehensive Intro. to Diff. Geometry, vol. I*, 3rd edition, Publish or Perish.
- W. Boothby, *An Intro. to diff. manifolds and Riem. geometry*, 2nd edition, Academic Press.
- V. Guillemin & A. Pollack, *Differential Topology*, First Edition, AMS Chelsea Publishing, 2010. (Reprint on original Prentice-Hall version, 1974).
- M. Spivak, *Calculus on Manifolds*, Addison-Wesley.
- J. Milnor, *Topology from the differential viewpoint*, Princeton.

Riemannian Geometry:

- J. Lee, *Riemannian manifolds: an introduction to curvature*, Springer.
- P. Petersen, *Riemannian Geometry*, 3rd edition, Springer.