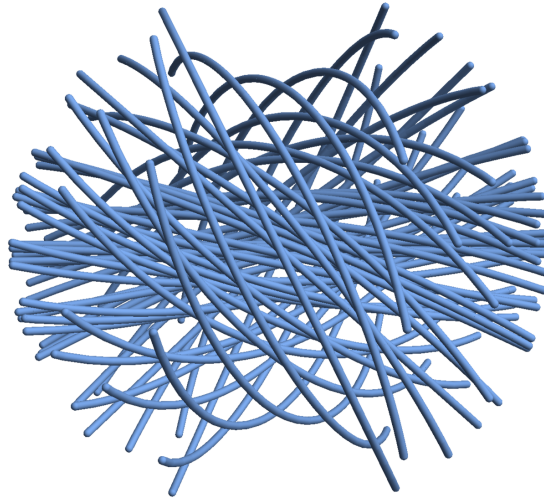


Math 550 - Differentiable Manifolds II

David Dumas

Spring 2019



1. BASIC COURSE INFORMATION

Course Web Page <http://dumas.io/math550/>

Primary Text J. M. Lee, Introduction to Smooth Manifolds.
Springer, 2012.
Location 317 Taft Hall
Meeting Time MWF 9am
CRN 37861
Instructor Email david@dumas.io
Office Hours MWF 11am
Office 503 SEO

2. COURSE CONTENT

Building on the foundational material from Math 549, we will discuss several aspects of the geometry and topology of smooth manifolds. The course will be divided into three roughly equal units focusing on the following topics:

- Smooth actions and quotients
- Bundles, connections, and curvature
- Symplectic manifolds

3. PREREQUISITES

- Math 549 or equivalent experience

4. GRADING

There are no exams in this course. Grades will be assigned on the basis of the homework problems (60%) and on the final presentation (40%). See below for detailed policies on each of these components.

Homework grades will be entered in an online gradebook on UIC's Blackboard course management system. This allows students to track their performance throughout the semester.

5. IMPORTANT DATES

| | | |
|-----------|---------|--|
| Jan 14 | Mon | First day of class |
| Jan 21 | Mon | No class (Martin Luther King, Jr. day) |
| Jan 25 | Fri | Add/drop deadline |
| Mar 11 | Mon | Presentation topic proposal deadline |
| Mar 20 | Wed | Presentation topic finalization deadline |
| Mar 22 | Fri | Late drop deadline |
| Mar 25-29 | Mon-Fri | No class (spring break) |
| May 3 | Fri | Last day of class |
| May 7 | Tue | Presentations 10:30am-12:30pm (scheduled final exam period) |

6. HOMEWORK

Problems sets will be posted on the course web page, with each problem set indicating the date when it is due. Some problems will be taken from the primary textbook (Lee). After the first few weeks, the usual schedule will be one problem set every two weeks, with the deadline on a Monday.

Complete instructions on how to submit homework will be given on the course web page, and will be announced in lecture.

Typesetting solutions in TeX/LaTeX is encouraged, but is not required. Handwritten assignments must be legible.

Students in the course may work on the problem sets in groups. However, each student must:

- Write, understand, and submit their own solutions, and
- Acknowledge collaborators by name on the assignment (e.g. write “in collaboration with Jane Doe” at the top of the first page)

Solutions to problems are works of mathematical writing—where clear communication is essential—and they will be evaluated as such. Thus, in order to receive full credit, a solution must be complete, correct, concise, and written in full sentences.

At the end of the semester, each student’s homework grade will be determined by converting all problem set scores to percentages, dropping the lowest one, and averaging the remaining percentages.

Submission of homework on paper is required. Please staple multi-page submissions.

The grade assigned to homework upon first submission is final. Homework cannot be resubmitted for additional credit.

7. PRESENTATIONS

Each student enrolled in the course will be required to give a 20-minute in-class presentation at the end of the semester on a topic related to the course material and selected in consultation with the instructor. The presentation should be expository (no original research) and should present a topic that is not planned for the regular course lectures. A list of topic suggestions will be posted on the course web page, and students are welcome to discuss potential topics with the instructor.

The process for selecting a presentation topic will be as follows:

First, a topic proposal must be submitted by email on or before **Monday, March 11**. This is the latest date for initial presentation topic proposals; it is recommended to submit the proposal much earlier. The topic proposal must contain the following information:

- The title of the proposed presentation
- A short description of the content of the presentation

- The primary reference(s) to be used in preparing the presentation

Even for students asking to present on one of the topics suggested by the instructor, preparing the proposal will involve some research to expand on the basic topic idea and to select an appropriate reference text. For this reason it is important for students to set aside time for preparing their proposals.

The instructor will acknowledge receipt of each email topic proposal (immediately) and then will reply (usually within 48 hours) to either approve the proposal, suggest changes, or to indicate that the topic is too similar to one that has already been proposed. Thus, for proposals on closely related topics, proposals received first have priority.

Students must receive final approval of their presentation topic (for example by providing any requested additional information based on the instructor's reply to their proposal) by **Wednesday, March 20**.

The presentations will take place during the scheduled two-hour final exam period (10:30am to 12:30pm on Tuesday May 7) and possibly, depending on the total number of presentations, during some of the lectures in week 15 of the course. The schedule of presentations will be announced on the course web page.

Preparing one's own presentation and attending the presentations of other students are both essential components of the course. Therefore, each of the following violations of course policies will result in a 10% reduction in the presentation grade:

- Failure to submit a topic proposal by Monday, March 11
- Failure to finalize the presentation topic by Wednesday, March 20
- Unexcused absence from any course meeting where student presentations are held

8. COMMUNICATION PREFERENCES

Email is the preferred and most reliable method of communication with the instructor outside of lecture and office hours.

9. PARTICIPATION

Students are encouraged to ask questions in lecture about the material currently under discussion, and to answer questions asked by the instructor.

Questions about recent homework problems, grading, past exams, etc., are better left to office hours.

10. ATTENDANCE

Students are responsible for all of the material covered in the lectures, including any lectures they miss. Any student who misses a lecture is advised to ask classmates for notes and information about any assignments or course announcements. Lecture notes are not provided by the instructor (in case of absence or otherwise).

Course meetings where student presentations are held (i.e. the final exam period and certain lectures in the last week) have their own, separate attendance policy: Attending these presentations is mandatory for all students, and unexcused absence from these meetings carries a specific grading penalty. See [Section 7](#) of the syllabus for details.

11. POLICY ON MISSED OR LATE WORK

In most cases, late homework is not accepted (i.e. a homework assignment not received by the stated deadline will result in a score of zero).

Exceptions are made with instructor approval and only under extraordinary circumstances, such as a severe illness, injury, or similar emergency. Documentation may be required. Students should contact the instructor as soon as possible regarding any missed or late work if they believe this policy applies.

12. CLASSROOM BEHAVIOR

In order to provide a classroom environment most conducive to learning, and to minimize distractions, students are asked to follow these guidelines:

- Use of electronic devices during class should be limited to purposes directly related to the course, such as note-taking¹.
- Electronic devices should be silenced during class.
- Making or receiving phone calls in the classroom is prohibited.
- Please do not to eat in class. (If this policy creates a hardship, please contact the instructor.)
- Video recording or photography in class requires advance permission from the instructor.

13. UNIVERSITY POLICIES

UIC requires that every syllabus mention the following university policies.

13.1. **Academic deadlines.** The UIC academic calendar can be found at:

<http://catalog.uic.edu/ucat/academic-calendar/>

In particular this calendar includes the deadlines for adding and dropping courses.

13.2. **Academic honesty and standards of conduct.** All UIC students are required to abide by the rules and standards of conduct described in the **Student Disciplinary Policy** (<https://go.uic.edu/DisciplinaryPolicy>). In particular, this policy prohibits academic misconduct such as plagiarism.

13.3. **Disability accommodation.** The University of Illinois at Chicago is committed to maintaining a barrier-free environment so that students with disabilities can fully access university programs, courses, services, and activities. Students with disabilities who require accommodations for access or participation in this course are welcome, but must be registered with the Disability Resource Center (DRC). Students may contact the DRC at 312-413-2183 (voice) or 312-413-0123 (TTY). Further information is available from the DRC web page (<http://drc.uic.edu/>).

13.4. **Religious holidays.** The UIC Senate Policy on religious holidays (approved May 25, 1988) is as follows:

“The faculty of the University of Illinois at Chicago shall make every effort to avoid scheduling examinations or requiring that student projects be turned in or completed on religious holidays. Students who wish to observe their religious holidays shall notify the faculty member by the tenth day of the semester of the date when they will be absent unless the religious holiday is observed on or before the tenth day of the semester. In such cases, the students shall notify the faculty member at least five days in advance of the date when he/she will be absent. The faculty member shall make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. If the student feels aggrieved, he/she may request remedy through the campus grievance procedure.”

The University Holidays and Religious Observances calendar can be found at:

<http://oae.uic.edu/religious-calendar/>

14. REVISION HISTORY OF THIS DOCUMENT

- 2019-01-13 Initial syllabus publication.

¹Taking notes by typing on a computer keyboard is *not* recommended, though it is permitted.