California State University Long Beach
Math 555 Topics in Topology: Differential Topology, Spring 2016

Professor : Ryan Blair
Email : ryan.blair@csulb.edu
Office : FO3-213
Office Hours : M 11:00am-12:00pm and Th 5:15-6:15pm

Class Meetings: TuTh 4-5:15pm LA5-271

Text: *Differential Topology* by Guillemin and Pollack
Course web page: http://www.csulb.edu/~rblair/Math555S16/index.html

Prerequisites: Math 550 or 550A

Course description: This course will be an introduction to differential topology. We will be studying the properties of differentiable structures on topological manifolds. A tentative list of topics include: smooth manifolds, smooth maps, transversality of intersections, Sard's theorem and the Whitney embedding theorem. If time permits, we will specialize to considering smooth embeddings of knots in R^3 and investigate various geometric invariants associated to these objects such as total curvature and distortion.

Student Learning Outcomes: Students will learn basic proof techniques involving differential structures on finite dimensional manifolds. Students will use these techniques to understand proofs of foundational theorems in the subject. Subsequently, students will learn how to apply these theorems in a variety of contexts.

Attendance: To be successful in this course, you should be present for all class meetings. For more information, see
http://www.csulb.edu/divisions/aa/catalog/current/academic_information/class_attendance.html

Homework: Homework assignments will be announced in class and posted on the course web page. They will be due as noted, typically once a week and always at the beginning of class. You are responsible for being aware of the assignments and due dates. Each homework will contain a reading assignment from the book and a list of problems. You are expected to complete and turn in all problems. Late homework must be turned in within 5 days of the due date for credit. Late homework will receive a 20% penalty.

You are strongly encouraged to work in groups to exchange ideas and help each other understand how to approach problems, but the work you turn in must be your own! If you work with others on an assignment, be sure to indicate the names of the other students on your homework. Homework must be legible, well-organized, and written in complete sentences. Handwritten work is fine, but you are encouraged to type up the problems in LaTeX.

Exams: There will be one midterm exams, according to the following tentative schedule:
1) Midterm 1: in class, March 10th

Final Project: The final project will give you the opportunity to explore a topic in differential topology at a deeper level. The project will have a written and oral presentation component. Additional information regarding the final project will be distributed later in the course.

Grades: Your grade for the course will be determined based on the following factors:

Homework 55 %
Midterm exam 15 %
Final Project 30 %

Office hours: I will hold regular office hours at the times noted above, unless I email or tell you otherwise in class. Alternatively, you may set up an appointment to meet with me.

Accommodations: Students needing accommodations because of a disability should first register with Disabled Student Services and present the appropriate forms issued by DSS to the instructor no later than two weeks from the date classes begin. Information regarding DSS can be found at http://www.csulb.edu/divisions/students2/dss/.

Withdraw: The last day to withdraw without receiving a W is **February 1**. The last day to withdraw without the CNSM dean's signature is **April 15**. Plan early since it's sometimes hard to track people down for signatures. Any office hour may be cancelled due to illness or necessary appointments, and the students should not therefore depend on a faculty member being in his/her office for a particular office hour. Students should secure any necessary signatures well in advance of any deadlines.

Academic Integrity: Academic integrity is expected for assignments and exams. The usual penalty for a student caught cheating or plagiarizing includes an F in the course. Further penalties may include probation, suspension, or expulsion from the university. More information can be found on http://www.csulb.edu/divisions/aa/catalog/current/academic_information/cheating_plagiarism.html

Note: The instructor reserves the right to alter anything on this syllabus at any time during the semester. Any alterations will be announced in class.