

SYLLABUS: ALGEBRAIC TOPOLOGY MATH 7045/8045

1. COURSE DETAILS

Instructor: Associate Professor Dr. David J. Gryniewicz

Office: Dunn Hall 367 Office Hours: By appointment

Webpage: www.diambri.org/AlgTopology

University of Memphis Email: djgrynkw

Location: Dunn Hall 103 (subject to change)

Time: MWF 10:20 – 11:15

Textbook: *Algebraic Topology* by **Hatcher**.

Reserved Final Exam Time: Monday 11/23/2020 08:00 – 10:00

Summary. This is an introductory graduate level course in Algebraic Topology. The goal is to introduce students to basic Homology and Cohomology theory. A basic background in Topology is needed (e.g., MATH 4411). Students should have already taken the Algebraic Theory Sequence (MATH 7261 and 7262) or be concurrently enrolled. Due to this course being cancelled, we will instead review any necessary background material as we go, meaning this requirement has been waived. We aim to cover Chapters 2 and 3 in our textbook, as well as parts of Chapter 4, time permitting. Topics covered will include Δ -complexes, Simplicial and Singular Homology, Homotopy, Cellular Homology, Cohomology, Cup Products, and Poincaré Duality.

Course Format. The course will have a seminar format, meaning there will be more emphasis on attending lectures and asking questions, with a limited amount of homework given during the semester. Final evaluation will be based on student presentations at the end of the semester.

Grading Scheme. Percentage of classes attended (20%), Homework Average (20%), Final Presentation (60%). Excused absences, including those related to CoVid, will not count against a student's attendance.

A small number of homework sets will be assigned with the bulk of each student's grade based upon a final presentation made by the student. Students may collaborate and help each other on the homework, but each student must write up the solution independently, in their own words and unaided. Simply transcribing someone else's solution can have serious consequences.

Students taking the course at the 8000 level will have some additional HW problems not required for students taking the course at the 7000 level.

The last few classes will be reserved for student presentations. Students will be asked to choose a topic from our textbook not yet covered in class and present the material from that section to the entire class.

CoVid: Due to recent developments, this class will be taught online for the entire semester. During our regularly scheduled class time, I will livestream our lecture from the university on Zoom. You will receive the link in advance and be expected to virtually attend the course. I will upload a copy of each lecture

to e-courseware afterwards. Should, at some point during the semester, I be forced into quarantine, then I will endeavour to video the missing lectures and upload them to e-courseware. Courses not streamed online will count automatically towards your attendance grade.

Students who have a positive COVID-19 test should contact the Dean of Students at deanofstudents@memphis.edu. Students who need additional resources can visit the Dean of Students Office website at <https://www.memphis.edu/deanofstudents/crisis/index.php>. Students with accessibility issues or learning accommodation issues due to a disability should contact Disability Resources for Students (DRS) to submit an official request for course accommodations. Contact DRS at 901.678.2880 or at drs@memphis.edu. (<https://www.memphis.edu/drs/index.php>)

Homework assignments will be posted on the course webpage or via email. They can be submitted as a SINGLE pdf file emailed to me. There are freely available apps/programs that allow you to convert photos to pdf files, and to convert multiple files into a single pdf file, that can be used as an alternative to an at-home scanner. Students will be asked to come to campus to stream their final presentation for the class via zoom, in a classroom empty apart from themselves and me. Such lectures will not be uploaded to e-courseware. In the event the lockdown is severe enough that entering university buildings is not permitted, or student quarantines prevent a student lecture from taking place, the final presentation portion of the grade will be replaced with a take-home final. If there are students who have already presented before this changeover in grading, they will have the option of also taking the take-home final and receiving the higher score between their presentation and the final. While on-campus, you will be expected to wear a mask/facial covering except when giving the lecture, and disinfectant will be provided.