Mathematics 821, Spring 2011 (Section #69608)
Algebraic Topology (3 credits)

Lectures: MWF 1:00 – 1:50 PM, 456 Snow Hall **(note room change)**

Instructor: Prof. Jeremy Martin (you can call me "Jeremy")
  E-mail: `jmartin@math.ku.edu` (the best way to contact me)
  Office: 623 Snow Hall, (785) 864-7114
  Office hours: Tuesdays 1:00–2:00, Wednesdays 2:00–3:00, or by appointment

Course description: Math 821 will cover elementary algebraic topology, including the fundamental group, simplicial and cellular homology. If time permits, we will discuss covering spaces and/or some cohomology.

Course website: `http://www.math.ku.edu/∼jmartin/math821/`

Check the website regularly. I will post problem sets there, as well as announcements, links, etc.

E-mail: I will periodically send class information (announcements, homework hints, etc.) to all students' KU e-mail accounts. You are responsible for checking your e-mail regularly so as to receive this information.

Prerequisites: Officially, "Math 820 or permission of instructor." Not all of the material covered in Math 820 will be necessary for Math 821, but you should know what a topological space is and what "continuous", "connected", and "compact" mean outside the context of metric spaces. You should also be comfortable working with vector spaces and groups — i.e., you should have taken or be taking Math 790/791, and preferably Math 830 as well.

Textbook: The official textbook is *Algebraic Topology* by Allan Hatcher (Cambridge U. Press, 2002). The text is available as a free download from the author's website, or can be purchased (e.g., from Amazon) for about $30. If you choose to download the PDF from Hatcher's website, do not print out a copy on the department printer! I will plan to cover chapters 0, 1 and 2.

Other books that may be helpful:

(1) J. Munkres, *Topology: A First Course* (a.k.a. "the red book") (Prentice-Hall, 1975). An excellent reference for basic topology. If you are comfortable with the material in the first three chapters of Munkres and you know some algebra, then you should be ready to take Math 821.
(2) G. Bredon, *Topology and Geometry* (Springer, 1993; reprinted 1997). I don't know this book well first-hand, but it has a good reputation. The topics covered and level of exposition are comparable to Hatcher's book.
(3) J. Munkres, *Elements of Algebraic Topology* (Addison-Wesley, 1984). Again, I don't know this book well first-hand, but Munkres' basic book is so good that this one probably is too.
(4) W. Massey, *Algebraic Topology: An Introduction* (Springer, 1977). Another standard book with a focus on covering spaces and the fundamental group; does not discuss homology.
(5) M.J. Greenberg and J.R. Harper, *Algebraic Topology: A First Course* (Benjamin/Cummings, 1981). A standard textbook with a fairly abstract, algebraic treatment.
(6) E. Spanier, *Algebraic Topology* (Springer, 1966; reprinted 1981). Ditto.

Coursework will consist of problem sets and a final exam.

- **Problem sets** will be due approximately biweekly. I'll post problems on the website, typically at least a week in advance. Most of the problems will be from Hatcher's textbook. You are encouraged to collaborate with other students, but you must write up the problems by yourself and acknowledge all collaborators. *You must submit typed solutions*, preferably using LaTeX (it is OK to draw figures by hand). Late homework will not be accepted. Homework is worth 60% of your final grade.

- **The final exam** is scheduled for **Monday, May 16, 10:30–1:00**. The exam is worth 40% of your final grade.

Blatant shill: Please attend the Combinatorics Seminar, which meets Wednesdays from 3–4 in Snow 408.

Makeup work: If, for some legitimate and unavoidable reason, you are unable to turn in a homework assignment on its due date, you must notify me *in advance* to make appropriate arrangements.

Incompletes: A grade of I is a rare occurrence and is reserved for cases in which a student has completed most of the course work at an acceptable level, but is prevented from completing the course due to extraordinary nonacademic circumstances. If you think an incomplete may be warranted, you must talk to me *before* the final exam.

Academic honesty and collaboration: You are required to abide by all KU policies on academic integrity. Cheating, plagiarism or other academic misconduct will result in a failing grade on the assignment in question, notification of the student's dean, and usually further disciplinary sanctions, possibly including a failing grade in the course.

You are encouraged to collaborate with other students on the homework assignments. However, *each student must write up his or her own solutions and acknowledge all collaborators.* Copying someone else's homework, or allowing someone else to copy yours, is considered to be a form of cheating.

Official KU policies on academic misconduct can be found at
https://documents.ku.edu/policies/governance/USRR.htm#art2sect6

Disability accommodations: The KU Office of Disability Resources (22 Strong Hall; 785-864-2620 (V/TTY); achieve@ku.edu; http://www.disability.ku.edu) coordinates accommodations and services for all students who are eligible. If you have a disability for which you wish to request accommodations, please contact Disability Resources as soon as possible. Please also contact me privately in regard to your needs in this course.

Religious accommodations: If you know that a scheduled assignment will conflict with a mandated religious observance, please contact me in advance to make appopriate arrangements.

Intellectual property: Course materials prepared by the instructor, together with the content of all lectures and review sessions, are the intellectual property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Upon reasonable request, the instructor will usually grant permission to record lectures, on the condition that such recording is used only as a study aid by the student making the recording, and is not modified or distributed in any way. Course materials posted online are intended for the personal use of students in the class and must not be redistributed without the instructor's consent.

Last update: Sat 1/22/11