

MA 752 – Topics in Topology
Fall 2026

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Course Website: www.ms.uky.edu/~kate/teaching/f26_752_syllabus.pdf.

Let's talk about spectra. We'll discuss different approaches to spectra and related topics. This may include:

- Freudenthal suspension and homotopy excision,
- the Spanier-Whitehead category,
- Atiyah duality,
- Adams' definition of the stable homotopy category,
- Brown representability,
- Lewis's proof that there is no good category of spectra,
- operads,
- diagram spectra (probably orthogonal), and
- equivariant spectra.

While some of these topics are technically very demanding (and fundamental to stable homotopy theory), the prerequisites are minimal (MA 651 and 661). These topics are **PARALLEL but definitely not the same** as those of MA 654.

There will be no homework in this class. Grades are based on participation

(Partial) list of relevant books and papers

- Aguilar, M. A., et al. *Algebraic Topology from a Homotopical Viewpoint*. Springer, 2002.
- Dieck, Tammo tom. *Algebraic Topology*. European Mathematical Society, 2008.
- May, J. Peter. *A Concise Course in Algebraic Topology*. University of Chicago Press, 1999.
- Chapters 1 and 2 of Margolis, H. R. Spectra and the Steenrod algebra. *Modules over the Steenrod algebra and the stable homotopy category*. North-Holland Mathematical Library, 29. North-Holland Publishing Co., Amsterdam, 1983.
- Chapters 2-4 of Part III of Adams, J. F. *Stable homotopy and generalised homology*. Chicago Lectures in Mathematics. University of Chicago Press, Chicago, Ill.-London, 1974.
- Lewis, L. Gaunce, Jr. *Is there a convenient category of spectra?* J. Pure Appl. Algebra 73 (1991), no. 3, 233246.
- Mandell, M. A., May, J. P., Schwede, S., Shipley, B. *Model categories of diagram spectra*. Proc. London Math. Soc. (3) 82 (2001), no. 2, 441512.

You can find the academic calendar here: <https://registrar.uky.edu/sites/default/files/2025-10/university-calendar-academic-year-26-27-final.pdf>.

Inclusivity and Disability Help Every student deserves to learn and participate in a classroom that is respectful and supportive. I commit to fostering such an environment for students of all identities, backgrounds, and abilities. Likewise, I expect each of you in this class to act with respect and support toward each other. If at any point you feel unwelcome or uncomfortable in this class, please reach out to me.

I aim to make this class accessible to all students. If you have trouble accessing, viewing, hearing, or responding to any of our class resources, please tell me so I can help you with them. You may seek disability support and documentation from UK's Disability Resource Center: <https://www.uky.edu/DisabilityResourceCenter/>. If you require classroom or testing accommodations (e.g.

a scribe, extended time on exams, etc.), please send me your DRC accommodation letter at least one week ahead of the first assignment you need it for.

University policies

- (1) **Academic policies:** This class will adhere to all of UK's official academic policies, which you can find here: <https://ombud.uky.edu/students/academic-policies>
- (2) **Integrity, Cheating and Plagiarism:** We will follow the Provost's office policies which you can find here: <https://provost.uky.edu/proposals/guidance-course-proposals/academic-offenses>

You are expected to maintain academic honesty in this course. You may work together on homework assignments, but the final submitted work must be your own. Quizzes and exams are individual assignments, and unless otherwise stated, you may not use any outside resources on these assessments. You may not discuss quiz or exam problems with other students who have not already taken the assessment yet. Remember, giving information about an assignment is considered cheating in the same way that receiving information is cheating. If you are unsure whether you are allowed to work with another person or use a certain resources on an assignment, please ask me!

Student Support The University of Kentucky has resources to enhance your well-being and mental health. Visit <https://studentsuccess.uky.edu/well-being> to see a list of services. Most are covered by student fees though you should consult with each website. These services may include:

- (TRACS) Triage, Referral, Assistance and Crisis Support to talk to a clinician for mental health support and referral. For further information, visit <https://studentsuccess.uky.edu/tracs>
- The Center for Student Support and Intervention (CSI) for someone to guide you through campus resources and/or if you need an explanation for an extended absence. For further information, please visit the site <https://studentsuccess.uky.edu/center-support-and-intervention>
- University Health Services (UHS) for managing primary physical care and other medical issues See their website to determine if UHS is best for your needs and schedule appointments. For further information, please visit the site <https://ukhealthcare.uky.edu/university-health-service>
- University Behavioral Health (UBH) for managing psychiatric conditions, diagnostic testing, and medication management. For further information, visit the site UHS Mental Health — UK Healthcare.
- The Disability Resource Center (DRC) for accommodation requests, based on diagnosed disabilities. See <https://studentsuccess.uky.edu/disability-resource-center>
- The Collegiate Recovery Program, for people in or exploring recovery from addiction. Please see: <https://studentsuccess.uky.edu/power/services/collegiate-recovery-program>

Please consider opportunities to use these services that do not conflict with your course attendance. If there are extenuating circumstances that you would like to discuss, please contact me by e-mail.

For further information, please see:

- UK Academic Policy Statements
- UK Mental Health Resources
- UK Academic Support
- UK Academic Ombud

AI course policy Idea generation, analytical thinking, and critical analysis are key outcomes in this course. As a result, all assignments submitted by the student must be 100% their original work. Generative AI tools should not be used for any stage of any assignment or activity – this includes brainstorming, fact checking, or grammar correction. Any submission of AI-generated content will be considered misuse in the context of this course.

Classroom Emergency Preparedness and Response Information Please go to [here](#) and look under “Classroom Emergency Preparedness and Response Information” for instructions and further information.

Course Copyright All original instructor-provided content for this course, which may include handouts, assignments and lectures, is the intellectual property of the instructor(s). Students enrolled in the course this academic term may use the original instructor-provided content for their learning and completion of course requirements this term, but such content must not be reproduced or sold. Students enrolled in the course this academic term are hereby granted permission to use original instructor-provided content for reasonable educational and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.