

Department of Mathematics and Statistics
MAT 516/616 — Introduction to Topology — Spring 2022

Course Description: Set theory, topology of the real line, topological spaces, metric spaces. (3 credit hours).

Prerequisites: Prerequisite: MAT 309 and 312.

Course Objectives: The student will learn the basic concepts and techniques in topology. Primary skills to be acquired are understanding the concepts of a topology and continuous functions, being able to solve simple problems involving those concepts, getting confident in proving things about highly abstract objects.

Instructional Activities: Lectures, problem solving, assignments.

Field, Clinical, Laboratory Experiences, Resources: None.

Instructor: Dubravko Ivanšić [DOO-brahv-ko EE-vahn-shich] Ivanšić is the last name.

Phone & e-mail: 809-3552, divansic@murraystate.edu

Office: Faculty hall 6A-1 (in the Department of Mathematics and Statistics annex)

Course webpage: (A link to this has also been placed on Canvas.)

<http://campus.murraystate.edu/academic/faculty/divansic/22spring/516home.html>

Office Hours: Ask me or check the webpage.

Textbook & Content Outline: Crump Baker, Introduction to Topology. We plan to cover most of the book. This book has had several printings: the newer you have, the better. (Your instructor has a printing from 2005.) We plan to cover most of the book.

Homework: Homework is a substantial portion of your grade (list is on the webpage). It will consist of a selection of problems of varying degrees of difficulty: type A (5-point), type B (8-point) and type C (12-point) problems. You are strongly encouraged to do all of the problems. For the ones you turn in, you can choose any of the assigned problems subject to the conditions below on the point-worth of the homework. You may turn in problems with greater point-worth than the minimum, but only the first 60 points' worth will be graded.

If you are taking this course as:	then turn in this many points per section:
undergraduate student (MAT 516)	≥ 30 points, at least 20% of total are type B problems or harder
graduate student (MAT 616)	≥ 30 points, at least 40% of total are type B problems or harder

Some Success Tips: As you read the textbook or your notes, make sure you have a pencil and paper with you. Work things out on paper as you read them. Whenever a definition is introduced, as you try to understand what the definition is supposed to capture, try to think of several objects that fit the definition and several that do not. Before you read a proof, see if you can figure it out yourself, based on the previous material. (If you have no idea, that's OK, too, then just try to understand the presented proof.) If you have trouble with the material, make sure you stop by for office hours. Many things can be made much clearer in conversation with me.

Exams: There will be three exams whose dates will be announced well in advance. Calculators will **not** be allowed on any of the exams.

Final exam: is comprehensive and will be held on Tuesday, May 10th at 1:30PM in our usual classroom.

Grade: Your homework score is computed as (points earned)/(points attempted), assuming you have satisfied the minimum point requirements. Your final grade is computed roughly as follows: homework will count for 40% of the grade and each exam counts for 20%. Your final exam grade replaces your poorest exam grade if it is better, so if you are happy with your exam scores during the semester, you don't have to take it.

Whether you have satisfied the minimal requirement for homework point-worth and how much you have done extra also affects your grade, but I don't have a formula for this. Guidance for the final grade scale is

$$90\%–100\%=A, 80\%–89\%=B, 70\%–79\%=C, 60\%–69\%=D, 0\%–59\%=E.$$

Attendance: Students are expected to adhere to the MSU Attendance Policy outlined in the current MSU Bulletins. Attendance is strongly encouraged every day, and roll will be taken. If you missed four or fewer classes during the semester, you get 3% bonus points. Note that you are not penalized for missing a class (the points are in excess of your total grade), so an absence is counted as such regardless of the reason (“excused” or not).

Make-ups: Make-ups for exams will be given only in cases of illness, field trips or other unavoidable circumstances. You will need to provide written verification of the reason for your absence in advance and as soon as possible. If you are unexpectedly absent from an exam, contact me by phone or e-mail **that same day** and arrange to take a make-up. The make-up should occur *soon*, which typically means “before I return the exam”. Make-ups for other graded work will be given at my discretion. Asking for a make-up more than once makes it less likely that I will grant it.

Academic honesty policy: Murray State University takes seriously its moral and educational obligation to maintain high standards of academic honesty and ethical behavior. Instructors are expected to evaluate students’ academic achievements accurately, as well as ascertain that work submitted by students is authentic and the result of their own efforts, and consistent with established academic standards. Students are obligated to respect and abide by the basic standards of personal and professional integrity.

Violations of Academic Honesty include: **Cheating** — Intentionally using or attempting to use unauthorized information such as books, notes, study aids, or other electronic, online, or digital devices in any academic exercise; as well as unauthorized communication of information by any means to or from others during any academic exercise; **Fabrication and Falsification** — Intentional alteration or invention of any information or citation in an academic exercise. Falsification involves changing information whereas fabrication involves inventing or counterfeiting information; **Multiple Submission** — The submission of substantial portions of the same academic work, including oral reports, for credit more than once without authorization from the instructor; **Plagiarism** — Intentionally or knowingly representing the words, ideas, creative work, or data of someone else as one’s own in any academic exercise, without due and proper acknowledgement.

Instructors should outline their expectations that may go beyond the scope of this policy at the beginning of each course and identify such expectations and restrictions in the course syllabus. When an instructor receives evidence, either directly or indirectly, of academic dishonesty, he or she should investigate the instance. The faculty member should then take appropriate disciplinary action. Disciplinary action may include, but is not limited to the following: 1) Requiring the student(s) to repeat the exercise or do additional related exercise(s); 2) Lowering the grade or failing the student(s) on the particular exercise(s) involved; 3) Lowering the grade or failing the student(s) in the course. If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.

Faculty reserve the right to invalidate any exercise or other evaluative measures if substantial evidence exists that the integrity of the exercise has been compromised. Faculty also reserve the right to document in the course syllabi further academic honesty policy elements related to the individual disciplines.

A student may appeal the decision of the faculty member with the department chair in writing within five working days. Note: If, at any point in this process, the student alleges that actions have taken place that may be in violation of the Murray State University Non-Discrimination Statement, this process must be suspended and the matter be directed to the Office of Equal Opportunity. Any appeal will be forwarded to the appropriate university committee as determined by the Provost.

Non-Discrimination Policy Statement: Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, sex, gender identity, sexual orientation, religion, age, veteran status, or disability in employment or application for employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities.

In particular and without limiting the preceding and pursuant to and consistent with the requirements of Title VI of the Civil Rights Act of 1964 and its regulations 34 CFR 100 et seq.; Section 504 of the Rehabilitation Act of 1973 and its regulations 34 CFR 104; Title IX of the Education Amendments of 1972, 20 USC 1681 et seq., and its regulations 34 CFR 106 et seq; and the Age Discrimination Act of 1975 and its regulations 34 CFR 110, Murray State University does not discriminate on the basis of race, color, national origin, sex, handicap, or age in its educational programs and activities. This non-discrimination in education programs and activities extends to employment and admissions and to recruitment, financial aid, academic programs, student services, athletics, and housing. Murray State is required by Title IX and 34 CFR part 106 not to discriminate on the basis of sex and the prohibition against sex discrimination specifically includes a prohibition of sexual harassment and sexual violence. Examples of prohibited sexual harassment and sexual violence can be found in the “Policy Prohibiting Sexual Harassment” which can be accessed via the link referenced in Appendix I.

Inquiries concerning the application of these provisions may be referred to: 1) the Executive Director of Institutional Diversity, Equity, and Access/ Murray State University Title IX Coordinator, Murray State University, 103 Wells Hall, Murray, KY 42071 Telephone: (270) 809-3155 Fax: (270) 809-6887; TDD: (270) 809-3361; Email: msu.titleix@murraystate.edu. or 2) the Assistant Secretary of the United States Department of Education, U.S. Department of Education, Office for Civil Rights, 400 Maryland Avenue, SW, Washington, D.C. 20202-1100; Telephone: (800)-421-3481 Fax: (202)-453-6012; TDD: (800)-877-8339; Email: OCR@ed.gov.

Services for Students with Disabilities Statement: Students requiring special assistance due to a disability should visit the Office of Student Disability Services immediately for assistance with accommodations. For more information, students with disabilities should contact the Office of Student Disability Services, 423 Wells Hall, Murray, KY 42071. Telephone: 270-809-2018 (Voice) 270-809- 5889 (TDD). Email: msu.studentdisabilities@murraystate.edu. Our office will contact professors directly regarding any specific accommodation needs that may be applicable to their particular classroom setting.

COVID-19-related addenda to syllabus

Face Covering/Mask Policy: Guidance and requirements for face masks may be revised as conditions change in the state and region. All students are required to abide by the University's guidance and/or requirements for face coverings throughout the term of this course. Please visit the Racer Restart (<https://www.murraystate.edu/racerrestart/>) page for the latest guidance on face coverings.

Counseling Resources on Campus: Murray State University has two centers on campus that offer free and confidential mental health services for students. The University Counseling Center is located in Suite C104 in Oakley Applied Science and will be offering both in-person and remote services this year. On-call counselors are available 9:00-3:00 Monday through Friday for walk-in sessions. To schedule an appointment, email them at msu.counselingcenter@murraystate.edu. For more information, call them at 270-809-6851 or visit their website at www.murraystate.edu/CounselingCenter. The Psychological Center is located in Wells Hall and will be offering primarily in-person sessions. You can reach them at 270-809-2504 or visit their website at www.murraystate.edu/PsychologicalCenter.

Free mental health self-help resources are available through TAO Connect. To access them, simply go to us.taconnect.org/register and sign in using your Murray State email address.

In a crisis situation, or after hours, please contact Murray State Police at 270-809-2222 or call 911 if you are off campus. You can also call the 24-hour crisis hotline at 800-592-3980 or contact the Crisis Text Line at 741-741.

Class Absence due to COVID-19: The University will observe the guidance provided by the CDC for the need to quarantine following exposure. Information will be made available on the Racer Restart webpage (<https://www.murraystate.edu/racerrestart/>). Students diagnosed with COVID-19 will contact their instructors and email msu.studentcovidpositive@murraystate.edu immediately. Students instructed to quarantine due to exposure should also contact their instructors, and email msu.studentcovidquarantine@murraystate.edu immediately. Instructors may make adjustments to due dates or other course requirements to accommodate the severity of the illness and/or the availability of resources needed to complete tasks. If possible, students will continue to check Canvas regularly, and maintain regular communication with their instructors.

Starfish Student Success Network: Your success is important! This course is part of the Murray State University student success initiative that utilizes the Starfish Student Success Network. Starfish may be used to communicate with you about your academic progress and get you help if you need it. Throughout the term, you may receive emails regarding your attendance, course grades or academic performance. To benefit, it is important that you check your Murray State email regularly and follow through on recommended actions. You may also be contacted directly by others on campus who care about your academic success and personal well-being. This may include your academic advisor and staff from Student Engagement and Success and other student support offices across campus. Starfish provides you with the opportunity to "Raise Your Hand" if you need help. Take advantage of this and other features by logging into your Starfish account through myGate. More information can be found at <https://murraystate.edu/starfish>.

Racer Safe and Healthy Guidelines: Check the Racer Restart webpage (<https://www.murraystate.edu/racerrestart/>) for the updated Racer Safe and Healthy Guidelines.