COURSE SYLLABUS

math 681

Topology 2

Spring 2022

Course Introduction

Credit Hours: 3

Prerequisite Courses: Topology 1, math 581

Instructor: Prof K. Chris Ciesielski

Class Meets: T&Th 2:30-3:45pm in 313 Armstrong Hall

Course Introduction: The topology can be considered as an abstract version of a classical geometry. However, most of the classical geometrical notions are lost in the process of generalizing old geometrical ideas. The subject of the course is highly theoretical. The main part of the course will be introducing new abstract notions and examining their properties by rigorously proving theorems. This is the second semester for this subject and we will study the subjects not covered in Topology 1, math 581: countability and separation axioms, Tychonoff Theorem, and metrization theorems; possibly also complete metric spaces, function spaces, Baire spaces.

Faculty Contact Information

Instructor Office Location: 308G Armstrong Hall

Office Hours: T&Th 11:20-12:00 and 1:45-2:30pm and by appointment

Instructor Email: kciesiel@mix.wvu.edu

Instructional Materials

Required Instructional Materials: *Topology*, 2nd edition, by James R. Munkres

Additional Instructional Materials: Class notes on eCampus, to be updated after each meeting

Course Learning Outcomes

Course Learning Outcomes: Students that successfully complete the course will be able to use the standard topological tools and theorems both in topological setting and in their application to real and complex analysis, functional analysis, and differential equations. The tools and theorems include: subspace and product topologies, open and closed sets, operations of interior and closure of sets; connected and compact spaces including Intermediate Value and Extreme Value theorems; countability and separation axioms, Urysohn lemma, Tietze extension theorem, Tychonoff theorem, metrization theorems, Peano space filling curve, Baire category theorem, nowhere differentiable functions.

Assessment

Short Descriptions of and Grading Criteria for Major Assignments/Assessments:

- midterm test and final test
- weekly written homework assignments
- daily short quizzes on the material (definitions theorem statements) you were to prepare

Weight/Distribution of Course Points:

- midterm test contributing 30% to the course grade
- final test contributing 30% to the course grade
- all homework assignments contributing 30% to the course grade
- all quizzes contributing 10% to the course grade

Mid-Semester Grade: course standing, in the procentage of credit available to that point, will be provided after mid term test is graded

Expected Timeline of Major Assignments/Assessments and Topics/Units: midterm test will be administered around the midterm grade due day

Final Grading Scale:

A 80% ≤ score
B 70% ≤ score <80%
C 60% ≤ score <70%
D 50% ≤ score <60%
F score <60%

Course and Institutional Policies

Attendance Policy: attendance is obligatory; justified missing of classes will be excused

Participation Policy: active participation in class activities (via asking questions and proposing solutions to discussed problems) is expected

Late Assignment and Missed Exam Policy:

- In all homework assignments I will be routinely asking you to rewrite solutions that are either incorrect or that, in my opinion, need more explanation. Missing homework by a deadline will be treated as an assignment needing rewrite. One or two rewrites will be allowed.
- Test missed under the circumstances that are considered a legitimate excuse can be retaken under the condition discussed with the instructor.
- Due to low point value of quizzes, they cannot be retaken.

Institutional Policies:
Students are responsible for reviewing policies on inclusivity, academic integrity, incompletes, sale of course materials, sexual misconduct, adverse weather, as well as student evaluation of instruction, and days of special concern/religious holiday statements.

Class format

I will use a flipped classroom model. This means that before any regularly scheduled class meeting you will be asked to read and learn (as much as possible) the new material by yourself. The material will be indicated in the online class notes and presented either at these notes or in the course textbook. The class time will be used to discuss the material you have read, clarify any unclear issues you may have with it, and to concentrate on deepening your understanding of the new definitions and results. This will be done in as much interactive way as possible. In particular, we will concentrate on solving problems associated with the material. I expect that the solutions will be found during the class time by the students, allowing for interactive discussions between students and, if necessary, me.

List of topics to be covered

Each of the following topics will be covered in approximately one week of classes:

- the countability axioms
- the separation axioms
- normal spaces
- the Urysohn lemma
- the Urysohn metrization theorem
- the Tietze extension theorem
- imbedings of manifold
- the Tychonoff theorem
- local finitenes
- the Nagata-Smirnov metrization theorem
- complete metric spaces and a space-filing curve
- Baire category theorem
- nowhere differentiable functions