

MAS331 (3:2:4)
Spring, 2010

Topology

MWF 1:00–1:50PM
Room E11-103

Instructor: Professor Ki Hyoung Ko (Office: E6-1-4408, Office Hour: 10 - 12 am on Tuesday or by appointment, Phone: Ext. 2719, Email: khko@kaist.ac.kr)

Course Description: This course deals with a classical part of topology, usually called point-set topology or general topology. The part is explicitly developed in the nineteenth century in order to clarify many ideas in analysis. We will try to cover most of basic materials including topological and metric structures, various topological properties such as compactness and connectedness, various constructions such as product, quotient, and metrization.

Textbook:

- **Main Text:** Donald W. Kahn, *Topology: An Introduction to the Point-Set and Algebraic Areas*, Dover, 1995.
- **Supplementary:** James R. Munkres, *Topology, 2nd Edition*, Prentice-Hall, 2000.

Syllabus:

- Week 1.* Background in Set Theory—countability, the axiom of choice and variants
- Week 2.* Metric spaces and continuous functions, Euclidean spaces
- Week 3.* Topological spaces, Bases and subbases
- Week 4.* Relative and product topology, continuity, homeomorphism
- Week 5.* Hausdorff spaces, Compactness, Heine-Borel theorem, Bolzano-Weierstrass theorem
- Week 6.* Tychonoff theorem, Connectedness, Path connectedness
- Week 7.* Axioms of countability, Separation axioms
- Week 8.* Midterm Exam
- Week 9.* Urysohn's lemma, Urysohn's metrization theorem
- Week 10.* Quotient spaces, Locally compactness, One-point compactification,
- Week 11.* Tietze extension theorem, Baire category theorem
- Week 12.* Paracompactness, Partition of unity
- Week 13.* Completely regular space, Stone-Cech compactification
- Week 14.* Function space, Compact-open topology
- Week 15.* Dimension theory

Homework: All of exercise problems in our textbook are homework. You do not have to hand in your homework and instead you practice with them to prepare for quizzes and exams. In recitation sessions, some of homework problems will be explained by teaching assistants or you may ask.

Recitation and Quiz: There will be a hour-and-half recitation class on each week except the first week. I will announce the detail about when and where. Quizzes will be given in recitation classes to check whether you are doing homework. Each quiz consists of 3 to 5 problems that are usually little or not modified from homework problems.

Course Grade: There will be 12 quizzes and a 3-hour final exam. Neither makeup quizzes nor a makeup final will be given under any circumstance. Instead you may drop two worst quiz scores. If you have to miss final exam, you should apply for an incomplete grade. Your course grade consists of quizzes 50%, final exam 40%, and attendance 10%.