King Fahd University of Petroleum & Minerals
Department of Mathematics and Statistics
First Semester (111)
Syllabus Math 521: General Topology
Dr. Mohammad Z. Abu-Sbeih

Textbook: J.R. Munkres, Topology, A First Course, Prentice-Hall, 1975.

Catalogue Description: Basic Set Theory (countable and uncountable sets, Cartesian products). Topological Spaces (basis for a topology, product topology, functions, homeomorphisms, standard examples), Connected spaces, path connectedness. Compact spaces, compactness in metrizable spaces, Countability axioms, first countable and second countable spaces. Separation axioms, Urysohn's Lemma, Urysohn's metrization theory. Compact metric spaces.

Prerequisite: MATH 421

OBJECTIVE: This course is designed to develop the fundamental concepts of general topology which are the basic tools of working mathematicians in a variety of fields.

MATERIAL TO BE COVERED: Basic Set Theory (countable and uncountable sets, Cartesian products), Metric Spaces, Topological Spaces, Neighborhoods, Boundary, Interior, and Closure, Bases and subbasis, Subspaces, Metric Topology, Convergence, Nets and Filters, Continuity, Homeomorphisms, and Topological Properties, First and Second Countable Spaces, Separable spaces, The Separation Axioms, Regular and Completely regular spaces, Normal and Completely Normal spaces, The Urysohn's Lemma, The Urysohn's Metrization Theorem, Compact Spaces, Lindelof Spaces, Limit Point Compactness, Local Compactness, Compactification, Product Spaces, Product of Compact Spaces, Quotient Spaces, Complete Metric Spaces, Baire Spaces, Connected Spaces, Locally Connected Spaces, Pathwise Connectedness, Components, Totally Disconnected Spaces, Some Standard Examples.

GRADING POLICY: (100%)
MAJOR EXAM # 1 (25%). Saturday, October 22, 2011, 6:30 – 8:00 p.m.
(Material): Basic set Theory, Metric Spaces, Topological Spaces, Continuous Functions, Convergence (Nets & Filters), Separation Axioms, Compact Spaces).
MAJOR EXAM # 2 (25%) [Monday, December 05, 2011, 6:30 – 8:00 p.m.]
(Material: Product Spaces and Quotient Spaces, Regular and Completely Regular Spaces, Normal and Completely Normal Spaces, Connected Spaces, Complete Metric Spaces).
HOMEWORK: 20% (To be assigned weekly in the class and will be due in the next week on each Tuesday in the class).
FINAL EXAM (Comprehensive): 30% (TBA).

NOTE: The students with more than six unexcused absences will be awarded DN grade. The students getting less than 50% in all the examinations may be awarded F grade.
OFFICE: 5-309, Phone 2697. (You may find me in the other office 5-401 Phone 2296)
OFFICE HOURS: Saturday, Monday, Wednesday: 1:00 – 2:30 PM **OR BY APPOINTMNENT.**

Week	Material Covered
3	Review of basic topological concepts, path connectedness, compactness in metric spaces, local compactness.
4	Countability and separation axioms: 1st countable spaces, 2nd countable saces, Lindelof spaces, Hausdorff, regular, and normal spaces. The Urysohn Lemma, and Tietze Extension Theorem. The Urysohn Metrization Theorem.
$2\frac{1}{2}$	Tychonof Theorem, Completely regular spaces, the Stone-Cech compactification.
3	Metrization theorems: Local finiteness, the Nagata-Smirnov theorem, paracompactness.
$2\frac{1}{2}$	Complete metric spaces, Ascoli's theorem, Baire spaces.

HOME WORK ASSIGNMENT

Page # Q #	
83 1, 4, 6	181 1, 5
91 1, 3	
92 7, 8, 9, 10	194 1, 2, 3
100 7, 15, 17, 18	205 3, 5
110 2, 7, 9, 14, 15	215 3[Reading], 4
116 5, 6, 7	
124 3, 7[Reading], 10	220 1, 3
132 6, 8	**Beside that each student was asked to give**
151 3, 4, 12	**At least two presentations in the class.**
158 1, 3, 5, 8, 13[Reading]	**[These are usually certain theorems or examples]**
171 1, 5, 9, 12[Reading]	
177 1, 4, 5	