BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus

INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout (Part-II)

Date : 02.08.2016

In addition to Part – I (General Handout for all courses appended to the Time – Table) this part gives further specific details regarding the course.

Name of Instructor: TRILOK MATHUR
Course No.: MATH F311
Course Title: INTRODUCTION TO TOPOLOGY

1. Scope and Objective of the Course: To introduce the students the concepts of logical thinking in abstract terms using formal and axiomatic methods and to lay the foundations for further studies in abstract Mathematics.

2. Course Description: Topology and topological spaces, Metric spaces, Product and Quotient topology, Continuity and Homeomorphism, Connectedness, Compactness, Normal spaces, Classification of compact surfaces.

3. Text Book: Munkres, J. R.: *Topology*, Pearson Education, 2000 (2nd Edition)

4. Reference Book(s):
   1. Armstrong, M.A.: *Basic Topology*, Springer UTM, 1983.
   2. Boltyanskii and Efremovich: *Intuitive Combinatorial Topology*, Springer Universitext, 2001.
   3. Adams C. and Franzosa R.: *Introduction to Topology Pure and Applied*, Pearson Education, 2009 (1st Edition)
   4. Simmons G. F.: *Introduction to Topology and Modern Analysis*, Tata McGraw Hill, 2004.

5. Course Plan:

Lec. No.	Learning Objectives	Topics to be covered	Sec. No.
1-4	Definition of topology and elementary examples of topological spaces.	Topological Spaces, Basis for a topology.	Chapter 2 Sec. 12-13
5-9	Constructing new topological spaces from a given topological space.	Order topology, Product topology on X×Y, Subspace topology.	Chapter 2 Sec. 14-16
10-11	Hausdorff axiom.	Closed sets, Limit point, Hausdorff spaces.	Chapter 2 Sec. 17
12-15	Continuity and properties of continuous functions.	Continuous functions and Homeomorphisms.	Chapter 2 Sec. 18
16-20	Methods for imposing topologies on sets.	The Product topology, The Metric topology and The Quotient topology.	Chapter 2 Sec. 19-22

21-25	Connectedness and its importance.	Connected spaces, Connected subspaces of Real Line, components	Chapter 3 Sec. 23-25
26-30	Compactness and its importance.	Compact spaces, Compact subspaces of Real Line, Limit point compactness, Local compactness	Chapter 3 Sec. 26-29
31-38	Countability and Separation Axioms.	First countable spaces, Second countable spaces, Regular spaces, Normal Spaces, The Urysohn Lemma, The Urysohn Metrization Theorem, The Tietze extension theorem.	Chapter 4 Sec. 30-35
39-40	The Tychonoff Theorem.	The Tychonoff Theorem.	Chapter 5 Sec. 37

6. Evaluation Scheme:

Components	Durations	Marks	Date & Time	Remarks
Continuous Assessment*	20 min.	60	Unannounced	Open book
Mid Semester Test	90 min.	60	6/10 2:00 - 3:30 PM	Close Book
Comp. Exam	3 hrs.	80	9/12 FN	Partially Open Book

(*) *Classroom performance tests will be conducted either in lecture sessions or in common hours and they will be unannounced & open book. Total **5** such tests of **20 Marks** and **20Min.** each will be conducted and **best 3** will be considered for final evaluation.* <u>**No makeup for classroom performance test will be given in any circumstances**</u>.

7. Students are advised to work out problems assigned in the class; some problems will be listed on NALANDA website for their reference. At least one problem from these problems will be asked in Mid-Semester & Comprehensive Exams.

8. Make-Up: All makeup requests should submit before the evaluation component.

9. Chamber Consultation Hour: Tuesday, 5th Hour

10. Notices: All notices concerning this course will be put up only on Department of Mathematics Notice Board and NALANDA.

Instructor – in – Charge

MATH F311