

Subject Code: 1SC2040408

Subject Title: Problems and Exercises

Course Objective:

- This is an introductory course Problem and Exercises in which Students should have a working knowledge of the basic definitions and theorems of the Topology, Operations Research, Differential Equations, and Group Theory, described in detail in the syllabus.

Note: Students will be required to prepare him/ her for the following units at the level up to M.sc mathematics for problems and exercises. The Regular teaching involves intensive problem session followed by problem assignments; and the examination would consist of **problems** only.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Tutorial	Theory	Tutorial	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
3	1	3	1	60	40	-	-	100

Subject Contents

Unit. No	Topic	Total Hours	Weight (%)
1	Topology: Topological spaces, Neighbourhoods, Hausdorff space, Closure of a subset of a topological space, Interior of a subset of topological space, Boundary of a subset of a topological space.	18	30
2	Operations Research: NWCM, LCM, VAM, Assignment Problem, Johnson's algorithm for n-job 2 machine, Johnson's algorithm for n-job 3 machine, Johnson's algorithm for n-job m machines.	18	30
3	DIFFERENTIAL EQUATIONS: Method of finding C.F., Sybolic Operator $1/f(D)$, Method of finding P.I., Shorter method of finding P.I., To find P.I. when $X=e^{ax}$, where a is constant, To finding P.I. when $X=\cos x$ or $\sin x$, To find the value of $1/f(D).x^m$, where m is positive integer, To find the value of $1/f(D).(e^{ax}V)$, where a is constant and V is a function of x. To evaluate $1/f(D).(XV)$, where V is a function of x.	16	25
4	Group Theory: Group, Permutation, Cayley's Theorem, Homomorphism.	12	15

Course Outcome:

On successful completion of the course, students should be able to

- Students shall be able to improve problem solving skill as well as implement the Mathematical concept to solve real world problems.

List of References:

- Munkres, J., Topology: A First Course, Prentice Hall of India Pvt. Ltd., New Delhi
- “Topology” – by J. Dugundji, Prentice – Hall of India, 1975.
- “Aspects of Topology” – by C. O. Christonson and W. I. Voxman, Marcel Dekker Inc., 1977.
- “General Topology” – by J. L. Kelley, D. Van Nostraml, 1950.

- I N Herstein, **Topics in Algebra**, Wiley Eastern Ltd.
- Shanti Narayan, **A text book of Modern Algebra**, S. Chand & Co.

- Erwin Kreyszing, Advanced Engineering mathematics, By. John Wiley & Sons Inc. New York, 1999.

- Ian N. Sneddon, Elements of partial Differential Equations, McGraw-Hill Book Compony, 1998.
- Operations Research , by. J.K.Sharma. Macmillan Publishers India Ltd.