**Curriculum Plan: B.Sc.Physical Sciences, III Year (Semester V)**

**Mechanics & Discrete Mathematics**

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| **Ms. Garima Gaur**Assistant ProfessorDepartment of MathematicsKalindi College (University of Delhi)Delhi- 110008Mobile: 9953227989**E- mail**: garimagaur@kalindi.du.ac.in |  | **Marks Distribution**  | **Theory** |  75 Marks |
| **Internal Assessment** |  25 Marks |
| **Classes Assigned** | **Lectures** |  3 lectures per week |
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| **Practical** |  |
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| **References** |  | **1. Ramsay, A. S. (1998). Statics, CBS Publishers and Distributors, Delhi (Indian Reprint).** **2. Roberts, A. P. (2003). Statics and Dynamics with Background Mathematics, Cambridge University Press.** **3. Rosen, Kenneth H. (2012). Discrete Mathematics and its Applications (7th ed.). McGraw-Hill Education (India) Pvt. Ltd.** |
|  | **Week** | **Topics** |  |
|  | **1st week** 20-24thJULY | Types of graphs: Simple graph, Directed graph |  |
| **2nd week** 26-31st JULY | Multi graph, and Pseudo graph |
|  | **3rd week** 2-7th AUG |  Graph modeling |  |
| **4th week** 9-14th AUG | Terminology and basics; Special graphs: Complete graph, Cycles, n-dimensional cubes |  |
| **5th week** 16-21st AUG | Terminology and basics; Special graphs: Complete graph, Cycles, n-dimensional cubes |  |
|  |  | Bipartite graph, Complete bipartite graph |  |
|  | **6th week** 23-28th AUG | Subgraph and basic algebraic operations on graphs |  |
|  | **7th week** 31st AUG- 4th SEP |  Cycles, Tree to be introduced as a connected graph with no cycles |  |
|  | **8th week** 6-11th SEP | Introduction to shortest path (least number of edges) problem |  |
|  | **9th week** 13-18th SEP | Solution of shortest path problem for simple graphs using complete enumeration |  |
|  | **10th week**20-25th SEP | Euler and Hamiltonian graphs (for undirected graphs only) |  |
|  | **11th week**27th SEP-1st-0CT | Königsberg bridge problem |  |
|  | **12th week**4-9th OCT | Statements and interpretations of (i) Necessary and sufficient conditions for Euler cycles and paths (ii) Sufficient condition for Hamiltonian cycles |  |
|  | **13th week**18-23rd OCT | Statements and interpretations of (i) Necessary and sufficient conditions for Euler cycles and paths (ii) Sufficient condition for Hamiltonian cycles |  |
|  | **14th week**25-30th OCT | Finding Euler cycles and Hamiltonian cycles in a given graph |  |
|  | **15TH and 16TH Week**1-15TH NOV  | Revision and discussion of previous year papers. |  |