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

**Mechanics & Discrete Mathematics**

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| **Ms. Garima Gaur**  Assistant Professor  Department of Mathematics  Kalindi College (University of Delhi)  Delhi- 110008  Mobile: 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. | | | |  |