Proposed syllabus
for

**Skill Enhancement Course Papers for**

**B.Sc.(H) Mathematics/ B.Sc. (Prog)/B.A.(Prog)**

Department of Mathematics
University of Delhi
Delhi-110007

| Sl. No. | CORE COURSE (12) | Ability Enhancement Compulsory Course | Skill Enhancement Course (SEC) (2) | Discipline Specific Elective DSE (6) |
|---|---|---|---|---|
| I | | | SEC-1 LaTeX and HTML | |
| II | | | SEC-2 Computer Algebra Systems and Related Softwares | |
| III | | | SEC-3 Operating System: Linux | |
| IV | | | SEC-4 Transportation and Game Theory | |
| V | | | | |
| VI | | | | |

**Skill Enhancement Course Papers**

**Semester-I**

**SEC-1  LaTeX and HTML**
**2L+ 2Practical per week**

Elements of LaTeX; Hands-on-training of LaTex; graphics in LaTeX; PSTricks; Beamer presentation; HTML, creating simple web pages, images and links, design of web pages.

[1] Chapter 9-11, 15

## Practical

Six practical should be done by each student. The teacher can assign practical from the exercises from [1].

## References:

[1] Martin J. Erickson and Donald Bindner, A Student's Guide to the Study, Practice, and Tools of Modern Mathematics, CRC Press, Boca Raton, FL, 2011.
[2] L. Lamport. LATEX: A Document Preparation System, User's Guide and ReferenceManual. Addison-Wesley, New York, second edition, 1994.

**Semester-II**

**SEC-2 Computer Algebra Systems and Related Softwares**
**2L+ 2Practical per week**

Use of Mathematica, Maple, and Maxima as calculator, in computing functions, in making graphs; MATLAB/Octave for exploring linear algebra and to plot curve and surfaces; the statistical software R: R as a calculator, explore data and relations, testing hypotheses, generate table values and simulate data, plotting.

[1] Chapter 12-14

**Practical**

Six practical should be done by each student. The teacher can assign practical from the exercises from [1].

**References:**
[1] Martin J. Erickson and Donald Bindner, A Student's Guide to the Study, Practice, and Tools of Modern Mathematics, CRC Press, Boca Raton, FL, 2011.
[2] L. Lamport. LATEX: A Document Preparation System, User's Guide and ReferenceManual. Addison-Wesley, New York, second edition, 1994.

**Semester-III**

**SEC-3 Operating System: Linux Linux**
**2L+ 2Practical per week**

The Operating System: Linux history, Linux features, Linux distributions, Linux's relationship to Unix, Overview of Linux architecture, Installation, Start up scripts, system processes (an overview), Linux Security, The Ext2 and Ext3 File systems: General Characteristics of, The Ext3 File system, file permissions. User Management: Types of users, the powers of Root, managing users (adding and deleting): using the command line and GUI tools. Resource Management in Linux: file and directory management, system calls for files Process Management, Signals, IPC: Pipes, FIFOs, System V IPC, Message Queues, system calls for processes, Memory Management, library and system calls for memory.

**References:**
[1] Arnold Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008.
[2] Cox K, Red Hat Linux Administrator's Guide, PHI, 2009.
[3] R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.
[4] Sumitabha Das, Unix Concepts and Applications, 4th Ed., TMH, 2009.
[5] Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, Linux in a Nutshell, 6th Ed., O'Reilly Media, 2009.
[6] Neil Matthew, Richard Stones, Alan Cox, Beginning Linux Programming, 3rd Ed., 2004.

**Semester-IV**

**SEC-4 Transportation and Game Theory**
**2L+ 1 Tutorial per week**


Transportation problem and its mathematical formulation, northwest-corner method least cost method and Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem. Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure.

**References:**
[1] Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
[2] F. S. Hillier and G. J. Lieberman, Introduction to Operations Research,- concepts and cases 9th Ed., Tata McGraw Hill, 2010.
[3] Hamdy A. Taha, Operations Research, An Introduction, Prentice- Hall, 9th Ed., 2010.