Semester 7

Core Course (Minor)

Course Code: 7MTMMIC1 (Credit: 4, Hours: 60; Full Marks: 100)

Course Name: Linear Programming Problem and Calculus 2

Marks and Credit distribution: Theory: 3 Credits, Tutorial: 1 Credit

End Semester exam: 50 Marks, Continuous Assessment: 20 Marks, Attendance: 5 Marks, Tutorial: 25 Marks

Course Outcome: Students will learn about Simplex method, Transportation and Assignment problem. In Calculus portion they will learn about multi-variable functions and results on their limit, continuity and differentiability. They will also learn about improper integration and some application of calculus.

Course Content:

Group A: Linear Programming Problem (Marks assigned for end semester: 12, 15 Hours)

1. Basic solutions and Basic Feasible Solution (BFS) with reference to L.P.P. Degenerate and Non-degenerate B.F.S. Problems
2. Slack and Surplus variables. Standard from of L.P.P. Fundamental theorem of L.P.P. (Statement only) Problems using simplex method.
3. Transportation and Assignment problems.

References

[1] An Introduction to L. P. P. – Ghosh and Chakravarty.
[2] Linear Programming- P. M. Karak.

Group B: Calculus 2 (Marks assigned for end semester: 38, 45 Hours)

1. Functions of two variables: limit and continuity of functions of two variables, partial derivatives, chain rule, higher order partial derivatives, Statements of Young's theorem and Schwartz's theorem for mixed derivatives. Euler's theorem on homogeneous functions of two variables.
2. Tangents and Normals: Cartesian Co-ordinates
3. Curvature and Radius of Curvature : Cartesian Co-ordinates
4. Definition of Improper Integrals, problems on convergence of improper integral Beta function, Gamma function and their properties.
5. Evaluation of Area: Cartesian co-ordinates, Parametric Form, Area included between two curves, Area in Polar co-ordinates,
6. Length of a curve, Volumes and Surfaces of Revolution: Rotation about x-axis, Rotation about any line.

References

[1] Integral Calculus - Maity and Ghosh.
[2] Differential Calculus - Maity and Ghosh
[3] Advanced Engineering Mathematics-E. Kreyszig