| <b>Course Code</b>   | CourseTitle  | L                                     | Τ   | Р   | С  |
|--|--|---------------------------------------|---|---|--|
| 23MAT08  | Optimization Techniques  | 3                                     | 1   | 0   | 4  |
| <b>Course Objective</b>  | ès:  |                                       |   |   |  |
|  | dents with the concept and an understanding of basic conce   | epts in                               |   |   |  |
|  | ming, Game Theory  |                                       |   |   |  |
|  | nming and Network Techniques   |                                       |   |   |  |
| 3. Application of e  | everything learnt in real life.  |                                       |   |   |  |
| <b>Expected Course</b>   | • Outcome:   |                                       |   |   |  |
| After completion of  | this course, students will be able to:   |                                       |   |   |  |
| 1.Understand the   | importance of optimization and to formulate and solve line   | ar prog                               | gram  | ming  |  |
| problems.  |  |                                       |   |   |  |
|  | importance of Transportation problems.   |                                       |   |   |  |
| U  | me Theory Concepts.  |                                       |   |   |  |
| 1  | ndings of Integer Programming problem  |                                       |   |   |  |
| 5.Construct and D  | emonstrate the basic concepts of PERT- CPM and their ap  | plicati                               | on  |   |  |
| Unit 1   | Linear Programming   |                                       | 1   | 12 ha   | ours                                     |
| llustration of LP Prol   | <b>Linear Programming</b><br>be of Operations Research and Introduction to Linear Programmers - Formulation exercises on LP Problems - Graphical<br>1- Dual Simplex Method   |                                       | ıg (L   | ,   |  |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method  | be of Operations Research and Introduction to Linear Progr<br>blems - Formulation exercises on LP Problems - Graphical<br>1- Dual Simplex Method   |                                       | ng (L<br>od of                                      | P) -<br>solv  | ing                                      |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br><b>Unit:2</b>   | be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical<br>I- Dual Simplex Method  | Metho                                 | ng (L<br>od of                                      | P) -<br>solv<br>12 h  | ing                                      |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC   | be of Operations Research and Introduction to Linear Progr<br>blems - Formulation exercises on LP Problems - Graphical<br>1- Dual Simplex Method   | Metho<br>ial basi                     | ng (L<br>od of                                      | (P) -<br>solv<br><b>12 h</b>  | ing                                      |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC   | be of Operations Research and Introduction to Linear Progr<br>blems - Formulation exercises on LP Problems - Graphical<br>d- Dual Simplex Method<br>Introduction to Transportation problem<br>n - LP formulation of the TP - Solution of a TP - Finding an init<br>EM -VAM) – Degeneracy in TP - Transportation Algorithm (MC  | Metho<br>ial basi                     | ng (L<br>od of                                      | .P) -<br>solv<br>12 h<br>sible  | ing                                      |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3   | <ul> <li>be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical</li> <li>d- Dual Simplex Method</li> <li>Introduction to Transportation problem</li> <li>n - LP formulation of the TP - Solution of a TP - Finding an init</li> <li>CM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem</li> <li>Game Theory</li> </ul>  | Metho<br>ial basi<br>DDI Me           | ng (L<br>od of<br>c feas<br>thod)                   | .P) -<br>solv<br>12 h<br>sible<br>-<br>12 l                             | ours                                     |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p   | be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical<br>1- Dual Simplex Method<br>Introduction to Transportation problem<br>n - LP formulation of the TP - Solution of a TP - Finding an init<br>PM -VAM) – Degeneracy in TP - Transportation Algorithm (MC<br>Travelling Salesman problem  | Metho<br>ial basi<br>DDI Me           | ng (L<br>od of<br>c feas<br>thod)                   | .P) -<br>solv<br>12 h<br>sible<br>-<br>12 l                             | ours                                     |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p   | <ul> <li>be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical</li> <li>d- Dual Simplex Method</li> <li>Introduction to Transportation problem</li> <li>n - LP formulation of the TP - Solution of a TP - Finding an init</li> <li>M -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem</li> <li>Game Theory</li> <li>Derson zero-sum games, Maximum- minimum principle, Game</li> </ul>  | Metho<br>ial basi<br>DDI Me           | ng (L<br>od of<br>c feas<br>thod)                   | (P) -<br>solv<br>12 h<br>sible<br>-<br>12 l<br>ut sa                    | ours                                     |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p<br>points, Mixed strateg<br>Unit:4<br>Construction of Integ                                   | be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical         d- Dual Simplex Method         Introduction to Transportation problem         n - LP formulation of the TP - Solution of a TP - Finding an init         CM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem         Game Theory         verson zero-sum games, Maximum- minimum principle, Game Siges, Graphical method.         Integer programming         ger programming problem- Differentiating between the simulation of the simulation of the simulation of the text of the text of the text of the text of text of the text of | Metho<br>ial basi<br>DDI Me<br>ames w | ng (L<br>od of<br>c feas<br>thod)<br>vitho<br>nd Ir | P) -<br>solv<br>12 h<br>sible<br>) -<br>12 h<br>ut sa<br>12 h           | ing<br>ours<br>nours<br>ddle             |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p<br>points, Mixed strateg<br>Unit:4<br>Construction of Integ                                   | <ul> <li>be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical</li> <li>d- Dual Simplex Method</li> <li>Introduction to Transportation problem</li> <li>n - LP formulation of the TP - Solution of a TP - Finding an init</li> <li>CM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem</li> <li>Game Theory</li> <li>person zero-sum games, Maximum- minimum principle, Game is a give, Graphical method.</li> <li>Integer programming</li> </ul>   | Metho<br>ial basi<br>DDI Me<br>ames w | ng (L<br>od of<br>c feas<br>thod)<br>vitho<br>nd Ir | P) -<br>solv<br>12 h<br>sible<br>) -<br>12 h<br>ut sa<br>12 h           | ing<br>ours<br>nours<br>ddle             |
| An overview and scop<br>llustration of LP Prof<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p<br>points, Mixed strateg<br>Unit:4<br>Construction of Integ<br>programming problem            | <ul> <li>be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical d- Dual Simplex Method</li> <li>Introduction to Transportation problem</li> <li>n - LP formulation of the TP - Solution of a TP - Finding an init EM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem</li> <li>Game Theory</li> <li>person zero-sum games, Maximum- minimum principle, Game is, Graphical method.</li> <li>Integer programming</li> <li>ger programming problem- Differentiating between the simm solution -Cutting plane algorithm, Branch and bound tech</li> </ul>  | Metho<br>ial basi<br>DDI Me<br>ames w | ng (L<br>od of<br>c feas<br>thod)<br>vitho<br>nd Ir | (P) -<br>solv<br>12 h<br>sible<br>) -<br>12 h<br>ut sa<br>12 h<br>ntege | ing<br>ours<br>ours<br>ddle<br>nour<br>r |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p<br>points, Mixed strateg<br>Unit:4<br>Construction of Integ<br>programming proble<br>Module:5 | be of Operations Research and Introduction to Linear Progradent Problems - Formulation exercises on LP Problems - Graphical d- Dual Simplex Method           Introduction to Transportation problem           n - LP formulation of the TP - Solution of a TP - Finding an init           CM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem           Game Theory           verson zero-sum games, Maximum- minimum principle, Game S, Graphical method.           Integer programming           ger programming problem - Differentiating between the simm solution -Cutting plane algorithm, Branch and bound tector           Network Techniques   | Metho<br>ial basi<br>DDI Me<br>ames w | ng (L<br>od of<br>c feas<br>thod)<br>vitho<br>nd Ir | (P) -<br>solv<br>12 h<br>sible<br>) -<br>12 h<br>ut sa<br>12 h<br>ntege | ing<br>ours<br>nours<br>ddle             |
| An overview and scop<br>llustration of LP Prob<br>LPP -Simplex Method<br>Unit:2<br>Transportation problem<br>solution (NWCM - LC<br>Assignment problem –<br>Unit:3<br>Game theory: Two-p<br>points, Mixed strateg<br>Unit:4<br>Construction of Integ<br>programming proble<br>Module:5 | <ul> <li>be of Operations Research and Introduction to Linear Progrations - Formulation exercises on LP Problems - Graphical d- Dual Simplex Method</li> <li>Introduction to Transportation problem</li> <li>n - LP formulation of the TP - Solution of a TP - Finding an init EM -VAM) – Degeneracy in TP - Transportation Algorithm (MC Travelling Salesman problem</li> <li>Game Theory</li> <li>person zero-sum games, Maximum- minimum principle, Game is, Graphical method.</li> <li>Integer programming</li> <li>ger programming problem- Differentiating between the simm solution -Cutting plane algorithm, Branch and bound tech</li> </ul>  | Metho<br>ial basi<br>DDI Me<br>ames w | ng (L<br>od of<br>c feas<br>thod)<br>vitho<br>nd Ir | (P) -<br>solv<br>12 h<br>sible<br>) -<br>12 h<br>ut sa<br>12 h<br>ntege | ing<br>ours<br>nour<br>ddle<br>nour<br>r |

## **Text Books** :

**1.** Kanti Swarup, P.K. Gupta and ManMohan, Operations Research, 13th edition, Sultan Chand and Sons, 2007.

**2.** Hiller S.H., Lieberman G.J.; Introduction to Operations Research; 7 th edition, McGraw Hill Publications

3. Panneerselvan. R. (2006), Operation Research, Prentice Hall of India Pvt Ltd.

## **Reference Books** :

**1.**Taha, H.A.; Operations Research: An Introduction; 8 th edition; Pearson Education Inc.

**2**. Sharma S.D., Sharma H.; Operations Research: Theory, Methods and Applications; 15th edition; Kedar Nath Ram Nath Publishers.

3. Hira and Gupta, (2001), Operations Research, S.Chand & Sons.