



## 1.1.2

### List of Employability/ Entrepreneurship/ Skill Development Courses with Course Contents

Colour Codes		
Employability Contents	Green	
Entrepreneurship Contents	Light Blue	
Skill Development Contents	Pink	
Name of the Subjects/Related to all three Components (Employability/ Entrepreneurship/ Skill Development)	Yellow	



### List of Courses having focus on Employability

Department : **Mathematics**

Program Name : **B.Sc., MSc.**

Academic Year : **2017-18**

#### **List of New Courses Introduced**

Sr. No.	Course Code	Name of the Course
01.	MM 4305 & 4405	Operations Research-I & II
02.	MM 4410	Programming Language- II

#### **MM 4305: Operation Research-I**

M.M. 60

**Note:** A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type six questions spread all over the syllabus carrying 12 marks (2 marks each). Rest all questions will carry 12 marks each.

Operation Research and its Scope. Necessity of Operation Research in Industry. Linear Programming- Simplex Method. Theory of the Simplex Method. Duality.

Other Algorithms for Linear Programming- Dual Simplex Method. Parametric Linear Programming. Upper Bound Technique. Interior Point Algorithm.

Transportation and Assignment Problems.

Network Analysis – Shortest Path Problem. Minimum Spanning Tree Problem. Maximum Flow Problem. Minimum Cost Flow Problem. Project Planning and Control with PERT-CPM.

#### **Text Books:**

1. G. Hadley, Linear Programming, Narosa Publishing House, 1995.
2. G. Hadley, Nonlinear and Dynamic Programming, Addison –Wesley, Reading Mass.
3. H. A. Taha, Operation Research- An Introduction, Macmillan Publishing Co. Inc., New York.
4. Kanti Swarup, P. K. Gupta and Man Mohan, Operations Research, Sultan Chand & Sons, New Delhi.
5. P. K. Gpta and D. S. Hira, Operations Research- An Introduction, S. Chand & Company Ltd. New Delhi.

#### **Reference Book:**

1. S. D. Sharma, Operation Research....

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## MM 4405: Operation Research-II

M.M. 60

**Note:** A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type six questions spread all over the syllabus carrying 12 marks (2 marks each). Rest all questions will carry 12 marks each.

Game Theory- Two- Person, Zero-Sum Games. Games with Mixed Strategies. Graphical Solution. Solution by Linear Programming.

Integer Programming- Branch and Bound Technique. Linear Goal Programming.

Dynamic Programming- Deterministic and Probabilistic Dynamic Programming.

Nonlinear Programming- One and multi-variable Unconstrained Optimization. Kuhn- Tucker Conditions for Constrained Optimization. Quadratic Programming. Separable Programming. Input-Output Analysis.

### Text Book:

1. G. Hadley, Linear Programming, Narosa Publishing House, 1995.
2. G. Hadley, Nonlinear and Dynamic Programming, Addison –Wesley, Reading Mass.
3. H. A. Taha, Operation Research- An Introduction, Macmillan Publishing Co. Inc., New York.
4. Kanti Swarup, P. K. Gupta and Man Mohan, Operations Research, Sultan Chand & Sons, New Delhi.
5. Prem Kumar Gpta and D. S. Hira, Operations Research- An Introduction, S. Chand & Company Ltd. New Delhi.

### Reference Book:

1. S. D. Sharma, Operation Research....

## MM 4410: Programming Language- II

M.M. 60

**Note:** A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type six questions spread all over the syllabus carrying 12 marks (2 marks each). Rest all questions will carry 12 marks each.

Object Oriented Programming: Classes and scope, Nests classes, Pointer class members, class initialization, Assignment and Destruction, Overloaded functions and operators. Templates (including class templates), class inheritance and subtyping multiple and virtual inheritance.

### Text Books:

1. I.E. Balagurusmy, Object oriented programming with C++, Tata Mac-Graw Hill.
2. M.A. Weiss, Data structure and alotothm Analysis in C++, Addison Wesley.

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