



INTERNATIONAL MANAGEMENT INSTITUTE, BHUBANESWAR

Post Graduate Diploma in Management (PGDM)

Management Science Application (OM505)

CREDIT: Full (2 credits)

SESSION DURATION: 60 Minutes

TERM: III

YEAR: 2018-2019

BATCH: 2018-20

FACULTY: Dr. Ranjit Roy Ghatak

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Office hours: 9: 30 a.m. - 5.30 p.m.

Course Introduction:

The objective of Management Science is to solve the decision-making problems that confront and confound managers in both the public and the private sector by developing mathematical models of those problems. These models have traditionally been solved with various mathematical techniques, all of which lend themselves to specific types of problems. Thus, Management Science as a field of study has always been inherently mathematical in nature, and as a result sometimes complex and rigorous. Even if these techniques are not used on the job, the logical approach to problem solving embodied in Management Science is valuable for all types of jobs in all types of organizations. Management Science consists of more than just a collection of mathematical modeling techniques; it embodies a philosophy of approaching a problem in a logical manner, as does any science. Thus, Management Science not only teaches specific techniques but also provides a very useful method for approaching problems. Management Science is **important** because it is a helpful tool used to solve complex problems under uncertainty. ... Management Science techniques fill this void with methods that quantify issues and give business managers a better basis for making decisions

Learning Outcome :

1. To develop competence and skill sets in using Management Science in a variety of contexts.
2. To display familiarity with Management Science and how Management Science concepts can be used to improve the competitive position of the firm.
3. To use analytical software tools to solve Management Science problems.

Course Pedagogy:

1. Class will be a mix of interactive lectures, case discussions, games, simulations and projects.
2. Each class will start with a presentation of relevant case by a group of students who will also cover the topic planned for that class.

Course Readings

- (1) ** Taylor, B. W. (2011), Introduction to Management Science, Pearson Education, Eleventh Edition.
- (2) Albright & Winston (2015), Management Science Modeling, Cengage learning, Fourth Ed.
- (3) Albright, S.C. & Winston, W.L., (2011), Management Science Modelling with Spreadsheets, Cengage learning, First, Edition.
- (4) Stevenson, W.J. & Ozgur, C. (2011). Introduction to Management Science with Spreadsheets, Tata McGraw-Hill, Seventh Edition.

Course Evaluation criteria:

Class Participation	10
Quizzes-2 Nos	20
Mid-Term	30
End Term Examination	40

Session Plan (Tentative):

Session No.	Topic	Learning Outcome	Course Reading from Book
1-2	The Management Science Approach to Problem Solving <ul style="list-style-type: none">• Management Science Application• Model Building• Computer Solution	LO1	Chapter 1
3-4	Management Science Modeling Techniques <ul style="list-style-type: none">• Business Usage of Management Science Techniques• Management Science Application: Management Science in Health Care	LO1, LO2	Chapter 1
5--6	Linear Programing: Computer Solution and Sensitivity Analysis <ul style="list-style-type: none">• Management Science Application: Optimizing Production Quantities at GE Plastics	LO1, LO3	Chapter 2

	<ul style="list-style-type: none"> • Management Science Application: Improving Profitability at Norske Skog with Linear Programming • Sensitivity Analysis 		
7-8	Linear programming: Modelling Applications <ul style="list-style-type: none"> • Management Science Application: A Linear Programming Model for Optimal Portfolio Selection at GE Asset Management • Linear Programming Blending Applications in the Petroleum Industry • Employee Scheduling with Operation Research 	L01, L03	Chapter 2
9-10	Integer Programming Models <ul style="list-style-type: none"> • Integer Programming Graphical Solution and Computer Solution of Integer Programming Problems with Excel • Management Science Application: Allocating Operating Room Time at Toronto's Mount Sinai Hospital 	L01, L03	Chapter 5
11-12	The Transportation Model <ul style="list-style-type: none"> • Computer Solution of a Transportation Problem • Management Science Application: Transportation Models at Nu-kote International 	L01, L03	Chapter 6
13	The Transshipment Model <ul style="list-style-type: none"> • Management Science Application: Transporting Mail at the U.S. Postal Service 	L01, L03	Chapter 6
14	The Assignment Model <ul style="list-style-type: none"> • Computer Solution of an Assignment Problem 	L01, L03	Chapter 6
	<ul style="list-style-type: none"> • Management Science Application: Assigning Umpire Crews at Professional Tennis Tournaments 		
15-16	Network Flow Models <ul style="list-style-type: none"> • Network Components • The Shortest Route Problem 	L01, L03	Chapter 7

	<ul style="list-style-type: none"> • The Minimal Spanning Tree Problem • Solution of Network Flow Problems with Excel • Management Science Application: Determining Optimal Milk Collection Routes in Italy 		
17-18	Multi-Criteria Decision-Making Problems <ul style="list-style-type: none"> • Goal Programming • Graphical Interpretation of Goal Programming • Solution of Goal Programming Problems with Excel • Management Science Application: Developing Television Advertising Sales Plans at NBC 	L01, L03	Chapter 9
19-20	Nonlinear programming <ul style="list-style-type: none"> • Constrained Optimization • Solution of Nonlinear Programming Problems with Excel • Management Science Application: Making Supplier Decisions at Ford with Nonlinear Programming 	L01, L03	Chapter 10

Academic Integrity:

Utmost care is taken as to maintain class decorum, follow the exact evaluation norms, conduct fair examinations, fair and transparent evaluation of examination papers so as to maintain the highest academic integrity.

Other remarks:

1. Finish all your personal needs before coming to class.
2. Be in class on time, no latecomers will be entertained after the roll call.
3. Cell phones should remain switched off during the entire duration of the class.
4. No laptops are allowed inside the class unless instructed by the instructor.
5. Institute's manual laid down policies will be followed regarding academic integrity.