INDIAN INSTITUTE OF TECHNOLOGY KANPUR

INDUSTRIAL AND MANAGEMENT ENGINEERING DEPARTMENT

IME634: MANAGEMENT DECISION ANAlYSIS

Instructor:	Raghu Nandan Sengupta
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Course Name:	(3-0-0-0-[9]) Management Decision Analysis
Course number:	IME634
Department:	Industrial and Management Engineering
Proposer′s Name:	N/A
Prerequisites:	N/A

Syllabus

Basic concepts of Linear Programming (LP), Non-Linear Programming (NLP), Quadratic Programming (QP), Reliability Optimization, Robust Optimization, etc; Multiple Objective Decision Making (MODM), Multiple Criteria Decision Making (MCDM); Decisions under uncertainty; Multivariate Data Analysis, Multiple regression models, Principle Component Analysis (PCA), Factor Analysis, Multivariate Analysis of Variance (MANOVA), Conjoint Analysis, Canonical Correlation, Cluster Analysis, Multidimensional Scaling, Structural Equation Modelling, etc. Non-parameter techniques like Data Envelopment Analysis (DEA), Analytical Hierarchy Process (AHP); Statistical Decision Trees; Utility analysis and its significance to MCDM and MODM; Concepts of heuristic approaches with introduction to variety of examples of heuristics methods

Text Books/References

1) Anderson, T. W., (2004), An Introduction to Multivariate Statistical Analysis, Wiley InterScience, ISBN: 9812-53-096-7.

2) Cooper, W. W., Seiford, L. W. and Tone K., (2000), Data Envelopment Analysis: A Comprehensive Text with Models, Applications, References and DEA Solver Software, Kluwer Academic Publishers, ISBN: 0-792-8693-0.

3) Dantzig, George B. and Thapa, Mukund N., Linear Programming: 1: Introduction; Springer, 1997, ISBN: 0-387-94833-3. URL: https://linux.ime.usp.br/~felipecp/linear_programming_vol1-dantzig_thapa.pdf

4) Dantzig, George B. and Thapa, Mukund N., Linear Programming: 2: Theory and Extensions; Springer, 1997, ISBN: 0-387-98613-8. URL: http://ruangbacafmipa.staff.ub.ac.id/files/2012/02/ebooksclub.org__Linear_Programming_2__Theory_and_Extensions.pdf

5) Johnson, R. A. and Wichern, D. W., (2002), Applied Multivariate Statistical Analysis, Pearson Education, ISBN: 81-7808-686-7.

6) Hair, J. F., Anderson, R. E., Tatham, R. L. and Black, W. C., (2006), Multivariate Data Analysis, Pearson Education, ISBN: 81-7758-573-8.

7) Luenberger, D. G. and Ye, Y., (2008), Linear and Nonlinear Programming, Springer, ISBN 978-0-387-74502-2.

8) Murty, K. G., Linear Programming; , Wiley, 1983, ISBN: 978-0-471-09725-9.

9) Parlos, P. M., (Edited), (2000), Multi-Criteria Decision Making Methods: A Comparative Study, Kluwer Academic Publishers, ISBN: 0-7923-6607-7.

10) Rardin, R. L., (2002), Optimization in Operations Research, Pearson Education, ISBN: 81-7808-671-9.

11) Walpole, R. E., Myers, R. H., Myers, S. L. and Ye, K., (2007), Probability & Statistics for Engineers & Scientists, Pearson Education, ISBN: 81-317-1552-3.

12) Winston, W. L., (2003), Operations Research: Applications and Algorithms, Cengage Learning, ISBN: 81-315-0190-6.

13) Zeleny, M., (1982), Multiple Criteria Decision Making, McGraw Hill Book Company, ISBN: 0-07-072795-3.

Students likely to take this course: M.Tech/PhD from the IME/other depts. with required background

Other faculty members who can teach this course: Prof. Avijit Khanra, Prof. S. V. Vanamala, Prof. Faiz Hamid, Prof. Shankar Prawesh, Prof. R. R. K. Sharma

Signature of Instructor Sd/- Raghu Nandan Sengupta

Evaluation Methodology

01) Class/Group Assignment: 25%

02) Quizzes (02 before mid-sem + 02 after mid-sem):   25%

03) Mid-semester Examination:	25%
04) Final semester Examination:	25%
Total:	100%

Other important points

01) The day an individual/group assignment is given if the student is absent then he/she will not be graded for the individual/group assignment

02) The syllabus for the quizzes will be announced before hand

03) The syllabus for the mid-sem and end-sem will be the total syllabus covered till that respective examination

04) The mid-sem and end-sem are closed book/notes examination

05) The quizzes may be open book/notes examination and the decision for he same will be announced before hand

06) No mobiles are allowed during class/quiz/mid-sem/end-sem

07) No borrowing/lending of calculators/tables/notes (in case of open book examination)

08) No student will be allowed to enter the class after the class starts which will be exactly as per time table