DATA ANALYSIS & DECISION MAKING - III

PROF. RAGHU NANDAN SENGUPTA
Department of Industrial & Management Engineering
IIT Kanpur

PRE-REQUISITES : Probability & Statistics Operations Research

INTENDED AUDIENCE : Masters in Business Administration, Masters in Economics, Masters in Statistics/Mathematics, Masters in Industrial Engineering, Masters in Operations Research/Operations Management, PhD in related fields as mentioned above

INDUSTRY SUPPORT : Manufacturing industry, chemical industry, steel industry, cement industry, etc.

COURSE OUTLINE :

This is the third part of the three part course (DADM-I, DADM-II, DADM-III) which covers "Operations Research and its tools with applications". In general Decision Analysis and Decision Making (DADM) covers three main areas which are: Multivariate Statistical Analysis with its applications, Other Decision Making Models like DEA, AHP, ANP, TOPSIS, etc., and Operations Research and its tools with applications. These three part DADM course will be more practical and application oriented rather than theoretical in nature.

ABOUT INSTRUCTOR :

Prof. Raghu Nandan Sengupta completed his bachelors in engineering in Mechanical Engineering from Birla Institute of Technology Mesra, Ranchi INDIA and his FPM (PhD) from Indian Institute of Management Calcutta, INDIA with specialization in Operations Management. His research interests are in Sequential Analysis, Statistical & Mathematical Reliability, Optimization and its use in Financial Optimization. His research work has been published in journals like Metrika, European Journal of Operational Research, Sequential Analysis, Computational Statistics & Data Analysis, Communications in Statistics: Simulation & Computation, Quantitative Finance, etc. At Indian Institute of Technology Kanpur, INDIA he is a Professor in the Industrial & Management Engineering department and teaches courses like Probability & Statistics, Stochastic Processes & their Applications, Management Decision Analysis, Financial Risk Management, etc. He is also the recipient of IUSSTF Fellowship 2008 and visited Operations Research & Financial Engineering department at Princeton University, USA, ERASMUS MUNDUS Fellowship 2011 to Warsaw University, POLAND, EU-NAMASTE Fellowship 2015 to IST, University of Lisboa, PORTUGAL, DAAD Fellowship 2015 to TU Dresden, GERMANY.

COURSE PLAN :

Week 1: Introduction, Ideas of Optimization and Modeling
Week 2: Linear Programming (LP) and related topics
Week 3: Simplex Method, Interior point Method and related concepts
Week 4: Non-Linear Programming (NLP)
Week 5: Goal Programming
Week 6: Stochastic Programming
Week 7: 0-1 Programming and other related methods
Week 8: Polynomial Optimization
Week 9: Reliability Based Programming
Week 10: Robust Optimization
Week 11: Other topics like Parametric programming, etc
Week 12: Multi-objective Programming