DATA ANALYSIS & DECISION MAKING - II

PROF. RAGHU NANDAN SENGUPTA
Department of Mechanical Engineering
IIT Kanpur

TYPE OF COURSE : Rerun | Elective | UG/PG
COURSE DURATION : 12 Weeks (24 Jan' 22 - 15 Apr' 22)
EXAM DATE : 23 Apr 2022

PRE-REQUISITES : Probability & StatisticsOperations 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

INDUSTRIES APPLICABLE TO : Manufacturing industry, chemical industry, steel industry, cement industry, etc.

COURSE OUTLINE :

This is the second 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**:** MCDM, MAUT and related concepts

Week 2**:** Utility theory, Pareto optimality and related concepts

Week 3**:** Decision Trees

Week 4**:** Data Envelopment Analysis (DEA)

Week 5**:** Analytical Hierarchy Process (AHP) and Analytical Network Process (ANP)

Week 6**:** TOPSIS

Week 7**:** ELECTRE

Week 8**:** PROMETHE

Week 9**:** MACBETH

Week 10**:** SWOT analysis and System analysis

Week 11**:** Other Decision Making tools

Week 12**:** Fuzzy Logic