ME 407: INDUSTRIAL ENGINEERING & OPERATIONS RESEARCH I *AUTUMN 2007*
Mon 10:35am – 11:30am, Wed 9:30am – 10:25am, Thu 9:30am – 10:25am;   Room ME 217

| **Instructors** | Narayan Rangaraj, | ME308, 7882, narayan.rangaraj@iitb.ac.in |
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INTRODUCTION

The areas industrial engineering and operations research are strongly related and have evolved in many ways with the fundamental belief that the performance of any system can be improved / optimized. There are a number of concepts, ideas, methodologies, techniques and systems which give support to this belief. Industrial Engineering (IE) concerns with the design, development and management of integrated systems of people, money, resources, knowledge, energy, and process in order to produce services and goods critical to economy. Operations research (OR) is the discipline of applying advanced analytical methods such as optimization, simulation, statistical and AI techniques to make better decisions. IE & OR skills, originally applied to manufacturing, are now applied to different industries and services

This course will be conducted in two parts, each with 50%.

PART A: COURSE PLAN   (Prof. Jayendran Venkateswaran)
       Module 1: Introduction to concepts of operations research and optimization
       Module 2: Linear programming: formulations and solutions, Simplex method
       Module 3: Duality, Dual Simplex, and sensitivity analysis
       Module 4: Transportation, Assignment, Resource Allocation problems, IP, MIP models
       Module 5: Concepts of NLP, Kuhn-Tucker conditions, conjugate gradient methods (TBA)

Course website   http://www.ieor.iitb.ac.in/~jayendran/me407/index.htm (for class notes/ info)
Textbook/ References
1. H.A. Taha, Operations Research: An Introduction, 8th ed., McGraw Hill, 2004
2. M.S.Bazaraa, J.J.Jarvis & H.D.Sherali, Linear programming & network flows, Wiley, 1990
3. F.S. Hillier & G.J. Lieberman, Introduction to Operations Research, 8th ed., McGraw Hill, 2004

Assessment plan for Part A (for 50 %)
       Quizzes & Assignments – 10%   MidTerm **-** 30%   End Semester - 10%

PART B: COURSE PLAN   (Prof. Narayan Rangaraj)
       Module 1: Economic Analysis: Capacity planning and breakeven analysis
       Module 2: Facility Planning: Models for plant and warehouse location & layout
       Module 3: Aggregate planning models and introduction to MRP/ERP
       Module 4: Introduction to service management

Course website   http://www.me.iitb.ac.in/~narayan (for class notes/ info)
Textbook/ References
1. S. Nahmias, Production and Operations Analysis, McGraw Hill, 1997
2. J.A. Lawrence, Jr. and B.A. Pasternack , Applied Management Science, 2nd ed,Wiley, 2004
3. L.J. Krajewski and L.P. Ritzman, Operations Management : Strategy and Analysis, Sixth Ed. , Pearson Education, 2002

Assessment plan for Part B (for 50 %)
       Quizzes & Assignments – 10%   End Semester - 40%

Attendance is compulsory to clear the course, as per the Institute rules.
Cheating, copying and plagiarism is not allowed in assignments, quizzes, exams etc. Detection of such practices will result in the appropriate penalties as prescribed by the Institute.
Please make sure that whatever you submit under your name is your own work.