

IME641A: Design of Production Systems

3-0-0-0-9

Course Objectives

IME641A introduces design aspects of different production systems, with the main focus on the manufacturing systems. Emphasis will be given on the use of operational research tools in resolving the design issues of production systems. The course is expected to equip students with relevant insights and analytical skills.

Prerequisites

Basic algebra and calculus

Course Contents

Production systems - Concepts, components and integrated view; Product decisions - Design and development, Reliability, maintenance and warranty, Ergonomics; Process decisions - Work design, Methods engineering, Capacity planning, Line balancing; Location and layout - Plant location and transportation, Plant layout and materials handling; Project management - Network model, Project scheduling; Service management - Design and delivery, Matching demand and supply; Supply chain - Concepts and design.

Special Emphasis

- Modelling, analysis and optimization of design problems
- Study of research papers in the domain

Class Schedule

Class room: C3, IME Building

Time: 2:00 pm to 3:15 pm, Monday and Thursday

Instructor

Dr. Avijit Khanra (Phone: 0512-679-6180, Email: kavijit@iitk.ac.in)

Office hour: 3:30 pm to 4:30 pm, Monday

Evaluation

1) End-sem exam	35%
2) Mid-sem exam	25%
3) Quizzes*	15%
4) Term-paper**	15%
5) Class participation***	10%

Total	100%

* There will be four in-class quizzes, two before the mid-semester examination and two after it. A quiz date will be announced in the previous class. Marks of the best three quizzes will be considered for grading. **There will be no make-up for a missed quiz.**

** A term-paper is an “in-depth” study of a chosen topic. It is to be done in groups of two. The topic must be identified before the mid-semester examination, and the final submission, which includes a presentation and a report, is due on the last class.

*** Evaluation of class participation is subjective. It will be measured primarily by student’s preparedness and inquisitiveness. In the absence of relevant data, which can happen for some students, cues will be taken from the other components.

Home assignments: At the end of most classes, to supplement the class discussions, a home assignment will be given. The solution will be discussed in the next class.

Grading Policy

A mix of absolute and relative grading policies will be adopted. First, a pass mark will be decided; students failing to secure the pass mark will get F grade. Then the interval between the pass mark and the maximum score will be split into four (or five) intervals corresponding to A, B, C, D (and E) grades. **UG and PG students will be graded separately.**

Attendance Policy

It goes without saying that 100% attendance is compulsory. Any student who is granted leave shall inform the instructor regarding his/her absence.

Honesty Practices

Dishonesty in any form will not be tolerated, and will be penalized.

Books & References

This being a PG course, there is no prescribed textbook. However, the following books are recommended as references, with the first one likely to be the most useful.

1. S. Nahmias, Production and Operations Analysis, McGraw Hill.
2. W.C. Turner, Introduction to Industrial and Systems Engineering, Prentice-Hall.
3. Askin and Goldberg, Design and Analysis of Lean Production Systems, Wiley India.
4. J.L. Riggs, Production Systems: Planning, Analysis and Control, Wiley India.