

Course Title: Engineering Management

Course Code: MGTS 403

Credit Hours: 3

Course Description:

This course provides engineering students knowledge and skills on management which they would need for technological leadership.

Course Contents:

Unit 1: Introduction to Engineering Management

Engineering and Management: Engineering, Management, Engineering Management-A synthesis; Historical Development of Engineering Management: Origins, the Industrial Revolution, Management Philosophies, Scientific Management, Administrative Management, Behavioral Management, Other Contributions

Unit 2: Functions of Technology Management

Planning and Forecasting: Nature of planning, the foundation for planning, some planning concepts, Forecasting, Strategies for Managing Technology, Numerical problems; Decision Making: Nature of Decision making, Management Science, Tools for decision making, Computer-based Information System, Implementation, Numerical Problems; Organizing: Nature of Organizing, Traditional Organization theory, Technology and Modern Organization structures, Teams; Human Aspects of Organizing: Staffing Technical Organization, Authority and Power, Delegation, Committees and Meetings; Motivating and Leading Technical People: Motivation, Motivation theories, Leadership, Leadership theories, Motivating and Leading Technical Professionals; Controlling: The process of control, Financial controls, Non-financial Controls

Unit 3: Managing Technology through the Product Life Cycle

Managing the Research Function: Product and Technology Life Cycles, Nature of Research and Development, Research Strategy and Organization, Selecting R&D projects, Protection of ideas, Creativity, Making R&D Organization Successful; Managing Engineering Design: Nature of engineering Design, Systems Engineering/New Product Development, Concurrent Engineering and CAL, Control Systems in Design, Product Liability and safety, Designing for Reliability, other “Ilities” in design

Unit 4: Managing Projects

Project Planning and Acquisition: Characteristics of a project, the project proposal process, Project Planning tools, CPM and PERT, Types of Contracts; Project Organization, Leadership and Control: Project Organization, The project manager, Motivating project performance, Controlling cost and schedule

Unit 5: Managing your Engineering Career

Achieving Effectiveness as an Engineer: Charting your Engineering Career, Communicating your ideas, staying Technically Competent; Professional ethics and Conduct

Unit 6: Special Topics in Engineering Management

Ergonomics: Objectives and Importance of Ergonomics, Loads and stresses at Workplace, Consideration in Designing Layout of working Space; Introduction Total Quality Management: Total Quality Management, Quality Gurus, Costs of Quality, Benchmarking; Introduction to Lean Management: Lean Management, Wastes in Processes, Lean Principles

References:

1. Daniel L. Babcock, Lucy C. Morse, *Managing Engineering and Technology*, Prentice Hall India Pvt. Ltd.
2. A. K. Gupta, *Engineering Management*, S. Chand Publications
3. S.K. Sharma, S. Sharma, *Industrial Engineering and Organization Management*, Kataria & Sons
4. Alan Graham, Shoji Shiba, David Walden, *A new American TQM- Four Practical in Management*, CRC Press
5. J.A.F Stoner, R.E. Freeman & D. R. Gilbert, *Management*, 1995, Prentice Hall
6. Heinz Weihrich, Harold Koontz, *Management – A global perspective*, International edition , 1994, McGraw-Hill