

**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