

## **MF5007 INDUSTRIAL ERGONOMICS**

### DETAILED SYLLABUS

#### **OBJECTIVES**

To introduce the concepts of Ergonomics and to indicate the areas of Applications.

#### **UNIT I INTRODUCTION**

Concepts of human factors engineering and ergonomics – Man – machine system and design philosophy – Physical work – Heat stress – manual lifting – work posture – repetitive motion.

#### **UNIT II ANTHROPOMETRY**

Physical dimensions of the human body as a working machine – Motion size relationships – Static and dynamic anthropometry – Anthropometric aids – Design principles – Using anthropometric measures for industrial design – Procedure for anthropometric design.

#### **UNIT III DESIGN OF SYSTEMS**

Displays – Controls – Workplace – Seating – Work process – Duration and rest periods – Hand tool design – Design of visual displays – Design for shift work.

#### **UNIT IV ENVIRONMENTAL FACTORS IN DESIGN**

Temperature – Humidity – Noise – Illumination –Vibration – Measurement of illumination and contrast– use of photometers – Recommended illumination levels. The ageing eye – Use of indirect (reflected) lighting – cost efficiency of illumination – special purpose lighting for inspection and quality control – Measurement of sound – Noise exposure and hearing loss – Hearing protectors – analysis and reduction of noise – Effects of Noise on performance – annoyance of noise and interference with communication – sources of vibration discomfort.

#### **UNIT V WORK PHYSIOLOGY**

Provision of energy for muscular work – Role of oxygen physical exertion – Measurement of energy expenditure Respiration – Pulse rate and blood pressure during physical work – Physical work capacity and its evaluation.

#### **REFERENCES**

1. E.J. McCormic & Mark S. Sangers, Human factors in engineering design, McGraw Hill 2007
2. Martin Helander, A guide to the ergonomics of manufacturing, East West press, 2007
3. R.S. Bridger Introduction to Ergonomics, McGraw Hill, 1995.