

SYLLABUS :-

Prerequisite: None

Ergonomics Fundamentals: Simple and complex worksystems, Ergonomic aspects in workstation design and analysis, History of ergonomics, Modern ergonomics.

Anthropometric Principles and Postural Analysis in Workspace Design:

Anthropometry and its uses, principles of applied anthropometry, applications of anthropometry in design, postures and body mechanics, musculoskeletal problems in sitting and standing.

Design of Manual Handling Tasks: Anatomy and biomechanics of manual handling, design of manual handling tasks; lifting and carrying, NIOSH approach, EC guidelines.

Physiology, Workload, and Work Capacity: Physical work capacity, factors affecting work capacity, measurement of physiological cost of work, fitness for work.

Design of Physical Environment: Human thermoregulation, measuring thermal environment, measurement of light, lighting design considerations, measurement of sound, industrial noise control, vibration, principles for the design of visual displays, design of control, work organization and worksystem design.

Work Study Fundamentals: Productivity, Definition and Scope of Motion and Time Study, History of Motion and Time Study, Work Methods Design - the Broad View and Developing a Better Method, Reducing Work Content and Ineffective Time, Human Factors in the Application of Work Study.

Problem Solving Tools: Exploratory Tools, Recording and Analysis Tools, Quantitative Tools, Worker and Machine Relationships, and Operation Analysis.

Method Study: Process Analysis, Activity Charts, Man-Machine Charts, Operation Analysis, Different Charts and Diagrams Used, Basic Procedure, Micro Motion Study, Fundamental Hand Motions, Principles of Motion Economy, Use of Films in Method Analysis.

Work Measurement: Its Purposes and Uses, Basic Procedure, Techniques of Work Measurement - Work Sampling, Stop-Watch Time Study, Concepts of Rating and Allowances, Setting Standard Times for Jobs, Standard Data, Predetermined Time Standards: Work-Factor, and Methods-Time-Measurement.

Job Evaluation: Basic Concepts, Different Methods (Objective and Subjective) and their Use, Compensation Schemes, Relationship of Work Study to Incentive Schemes, Wage Incentive Plans.

Textbooks and References

- Methods, standards, and work design, Niebel, W. B. and Freivalds, A., McGraw Hill, 2004.
- Human Factors in Engineering and Design, Sanders, M. S. and McCormick, E. J., McGraw-Hill, Sixth Edition.
- Introduction to Ergonomics, Bridger, R. S., McGraw-Hill, 1995.

- A Guide to the Ergonomics of Manufacturing, Halender, M., East-West Press (Taylor and Francis), 1996.
- Motion and Time Study: Design and Measurement of Work, Barnes, R. M., John Wiley and Sons, 1980.
- Introduction to Work Study, International Labor Organization, Third Revised Edition.