

**Objective**

*To acquaint and equip with the ergonomic aspects in the design of farm machinery for safety of human beings*

**UNIT I**

Concept and design criteria for optimum mutual adjustment of man and his work: Importance of ergonomics and its application in agriculture, liberation and transfer of energy in human body, concept of indirect calorimeter, work physiology in various agricultural tasks.

**UNIT II**

Physiological stress indices and their methods of measurement: Mechanical efficiency of work, fatigue and shift work.

**UNIT III**

Anthropometry and Biomechanics: Anthropometric data and measurement techniques, joint movement and method of measurement, analysis and application of anthropometric data, measurement of physical and mental capacities.

**UNIT IV**

Human limitations in relation to stresses and demands of working environments. Mechanical environment; noise and vibration and their physiological effects, thermal environment; heat stress, thermal comfort, effect on performance and behavior, field of vision, color discrimination, general guidelines for designing visual display, safety standards at work place during various farm operations and natural hazards on the farm. Farm safety legislation.

**UNIT V**

Man-machine system concept. Human factors in adjustment of man and his work. Design aspects of foot and hand controls on tractors and farm equipment. Design of operator's seat for agricultural equipment.

**Suggested Readings**

1. Bridger RS. 1995. *Introduction to Ergonomics*. McGraw Hill.
2. Charles D Reese. 2001. *Accident / Incident Prevention Techniques*. Taylor & Francis.
3. Gavriel Salvendy. 1997. *Hand Book of Human Factors and Ergonomics*. John Wiley & Sons.
4. Kromer KHE. 2001. *Ergonomics*. Prentice Hall.
5. Mathews J & Knight AA. 1971. *Ergonomics in Agricultural Design*. National Institute of Agric. Engineering, Wrest Park Silsoe, Bedford.
6. Mathews J Sanders, Cormicks MS & MCEj. 1976. *Human Factors in Engineering and Design*. 4th Ed. McGraw Hill.
7. William D McArdle. 1991. *Exercise Physiology*. 1991. Lea & Febiger.
8. Zander J. 1972. *Principles of Ergonomics*. Elsevier.
9. Zander J. 1972. *Ergonomics in Machine Design*. Elsevier.