

## Lesson n°5: Ergonomics

### *I. Introduction*

Ergonomics, also known as human factors engineering, is the scientific discipline focused on understanding the interactions between people and other elements of a system. The goal of ergonomics is to optimize human well-being and overall system performance. The term “ergonomics” comes from two Greek words: “ergon” meaning work and “nomos” meaning laws, thus referring to the “laws of work.” This field seeks to design environments, systems, and tools that fit the capabilities and limitations of human beings to enhance productivity, safety, and comfort.

### *II. History of Ergonomics*

Ergonomics emerged as a formal discipline during the early 20th century, though its roots can be traced back to the work of early engineers and military scientists during World War II. As technology advanced, engineers began to realize that poorly designed work environments and tools were contributing to worker fatigue, accidents, and inefficiency. Key milestones in the development of ergonomics include the work of Charles Babbage on mechanical calculators, and the contributions of pioneers like Frederick Taylor in the field of scientific management, who sought to optimize work processes for increased productivity.

### *III. Key Concepts in Ergonomics*

- a. **Physical Ergonomics:** This area focuses on human anatomy and physiology, particularly how the body interacts with the environment. This includes posture, movement, repetitive strain, and physical work demands. It involves designing

tools, workspaces, and tasks that reduce physical strain and prevent injuries like musculoskeletal disorders (MSDs).

- b. Cognitive Ergonomics:** Cognitive ergonomics deals with the mental processes that affect human interactions with systems, such as perception, memory, reasoning, and decision-making. The design of systems must account for human cognitive limitations, aiming to reduce errors, enhance efficiency, and improve user experience.
- c. Organizational Ergonomics:** This aspect involves the design of work processes, schedules, and organizational structures. It looks at improving work systems, optimizing team communication, reducing stress, and enhancing job satisfaction.

#### ***IV. Applications of Ergonomics***

Ergonomics is applied in various sectors, including:

- *Office Ergonomics:* Adjusting office furniture, seating arrangements, computer screens, and workstations to improve comfort and prevent physical strain.
- *Industrial Ergonomics:* Designing tools, machinery, and work environments to reduce worker injury and increase efficiency. This is crucial in manufacturing settings where repetitive tasks can lead to chronic injuries.
- *Healthcare Ergonomics:* Designing medical equipment and hospital environments that reduce fatigue and stress on healthcare workers while improving patient care.
- *Transport Ergonomics:* Ensuring that vehicles (airplanes, cars, trains) are designed to accommodate human drivers and passengers for safety and comfort.

Faculty of Humanities and Social Sciences

Department of Psychology

Level: 3<sup>rd</sup> year LMD organization and Work Psychology

Instructor: Ms. Saci Meriem

Module: English Language

## V. Benefits of Ergonomics

- ❖ Increased Productivity: By optimizing the work environment and tools, ergonomics enables employees to work more efficiently and with less effort.
- ❖ Health Benefits: Reducing physical strain helps prevent long-term health issues such as back pain, eye strain, and carpal tunnel syndrome.
- ❖ Enhanced Job Satisfaction: Comfortable and well-designed workspaces can improve employees' overall job satisfaction, leading to lower turnover and higher morale.
- ❖ Reduced Absenteeism: Well-designed workplaces can reduce the incidence of work-related injuries and illnesses, leading to fewer sick days.

## VI. Challenges in Implementing Ergonomics

Despite its clear benefits, implementing ergonomic principles can be challenging due to several factors:

- ✓ Cost of Implementation: Upgrading workstations, purchasing ergonomic tools, and redesigning workspaces can be expensive for employers.
- ✓ Resistance to Change: Some employees and organizations may be resistant to change, either due to the perceived inconvenience or lack of awareness about the importance of ergonomics.
- ✓ Variety of Human Needs: Designing a workplace that suits the needs of all individuals, considering varying body types and health conditions, can be complex.