



IQRA National University
Peshawar
Department of Electrical Engineering

INDUSTRIAL ELECTRONICS

Elective 4

Elective 5

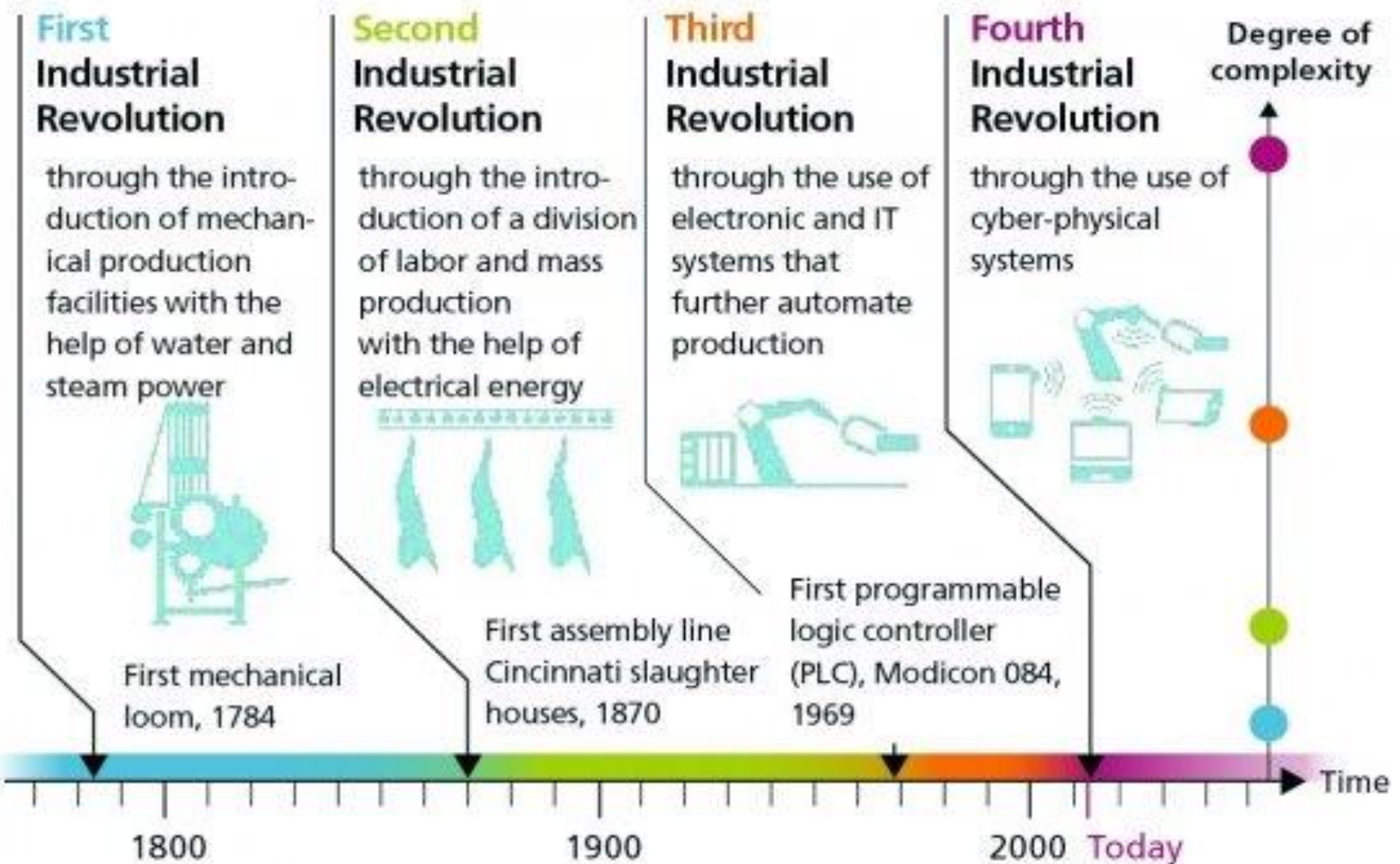
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Course Outline



Microsoft Office
Word Document

Industrial Revolutions



Importance of Industrial Electronics

- Industrial electronics refers to equipment, tools and processes that involves in an industrial setting. For example Automotive plant, power plant chemical processing plants, oil/gas/petroleum plants, mining and metal processing units, electronics and semiconductor manufacturing.
- The scope of industrial electronics ranges from the design and maintenance of simple electrical fuses to complicated programmable logic controllers (PLCs), solid-state devices and motor drives.

Current Situation

Industrial Automation is a high growth sector globally hence it is essential to all professionals and students to have practical knowledge about the hardware and software used in Industrial Automation.



WITHOUT JOB



WITH JOB

Industrial Safety

Industrial safety is primarily a management activity which is concerned with Reducing, Controlling, Eliminating hazards from the industries.

Significance of Industrial Safety

- Industrial un-safeties causes a great loss to both the Employer & Employee
- Cost of loss to the worker and his family
- Cost of the damage of machinery
- Cost of wages payable during injury
- Cost of training a new worker
- Cost of the lost time
- Cost of investigation
- etc

Objectives of Industrial Safety

- To prevent accidents in the plant by reducing the hazard to minimum.
- To eliminate accident caused work stoppage and lost production.
- To achieve lower workmen's compensation, insurance rates and reduce all other direct and indirect costs of accidents.
- To prevent loss of life, permanent disability and the loss of income of worker by eliminating causes of accidents.
- To evaluate employee's morale by promoting safe work place and good working condition
- To educate all members of the organization in continuous state of safety mindless and to make supervision competent and intensely safety minded.

Measurement & Records of Accidents

A. Accident Frequency Rate

Formula:
$$\frac{\# \text{ of Lost-Time Injuries} \times 200,000}{\text{Total Hours Worked}}$$

Sample Data:
$$\frac{5 \times 200,000}{111,935}$$

Frequency Rate: **8.93**

Based on 5 lost-time injuries for 111,935 hours of exposure, this company would experience 8.93 lost-time injuries by the time they reached 200,000 hours. Note: 200,000 hours represents the equivalent of 100 employees working 1 full year.

B. Accident Severity Rate

Formula: $\frac{\text{\# of Work Days Lost} \times 200,000}{\text{Total Hours Worked}}$

Sample Data: $\frac{18 \times 200,000}{111,935}$

Severity Rate: **145**

Based on 81 lost workdays for 111,935 hours of exposure, this company would experience 145 days lost by the time they reached 200,000 hours.

Causes of Industrial Accidents

- Unsafe conditions
- The job itself
- Work schedules
- Psychological conditions
- Machinery & Equipment
- Unsafe Acts

Industrial Safety Procedures

- **Engineering:**
Safety at the design, equipment installation stage.
- **Education:**
Education of employees in safe practices.
- **Enlistment:**
It concerns the attitude of the employees and management towards the job and its purpose.
- **Encouragement:**
To enforce adherence to safe rules and practices.

Safety Instruments

