



JECRC Foundation



**JAIPUR ENGINEERING COLLEGE
AND RESEARCH CENTRE**

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTER

Class – VI A & B

Subject – Construction Technology & Equipment

Ch – 3

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VISSION AND MISSION OF INSTITUTE

VISION

To become a renewed center of outcome based learning, and work towards academic, professional, culture and social enrichment of the lives of inviduals and communities.

MISSION

Focus on evaluation of learning outcomes and motivate students to inculcate research Aptitude by project based learning. Identify, based on informed perception of Indian, Regional and global needs, areas of focus and provide platform to gain knowledge and solutions. Offer opportunities for interaction between academia and industry. Develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

VISSION AND MISSION OF DEPARTMENT

VISION

To become a role model in the field of Civil Engineering for the sustainable development of the society.

MISSION

- 1)To provide outcome base education.**
- 2)To create a learning environment conducive for achieving academic excellence.**
- 3)To prepare civil engineers for the society with high ethical values**

SYLLABUS

S NO.	CONTENT
1	Introduction: Objective, scope and outcome of the course.
2	Engineering Economy: Principle of Engineering Economy, Minimum cost point analysis, Breakeven point analysis, Depreciation and depletion
3	Safety in construction: Causes, classification, cost and measurement of an accident, safety programme for construction, protective equipment, accident report, safety measure: (a) For storage and handling of building materials. (b) Construction of elements of a building (c) In demolition of buildings; Safety lacuna in Indian scenario. Fire safety provisions as per NBC.
4	Construction Planning: Need of construction planning, Constructional Resources, construction team, stages in construction, preparation of construction schedule, Job layout, inspection and quality control; Materials Management: Objective and functions of material management
5	Construction Equipment and Management: Earth Moving Equipment-Bull dozers tractor pulled scrapers Power shovels Draglines clamshells; cranes; Hoes, Trenching machine types Hauling Equipment; Drilling, Blasting and Tunneling Equipment; Pile Driving Equipment

COURSE OUTCOME

CO 1	To understand the concept of Engineering Economy, Depreciation and Depletion.
CO 2	To understand safety in construction.
CO 3	To understand need of construction planning and objective of material management.
CO 4	To understand the various technology and equipment involved in construction.

ACCIDENT

Accident is an undesirable or unfortunate happening that occurs unintentionally and usually results in harm, injury, damage, or loss; casualty; mishap.



CAUSES OF ACCIDENT

There are many causes of an accident on a construction site. The top causes of construction worker deaths on the job were falls, followed by struck by object, electrocution, and caught-in/between. These “Fatal Four” were responsible for nearly three out of five of the construction worker deaths.

Many accidents may be attributed to some type of negligence and may involve unsafe work site conditions, improper use of tools and-or equipment, and lack of protective safeguards.

Some examples of construction site accidents are more common than others. Below is a list of the more common ones starting with the Fatal Four.

- 1. Falls :-** Falls accounted for 278 out of 775 (36%) total deaths in construction in 2012, according to OSHA (Occupational Safety and Health Administration). An injury of this type may occur when a worker near an open-sided floor steps backwards or sideways without looking. The main cause of death in construction occurs where inadequate or no fall protection is provided.
- 2. Struck by object :-** Seventy-eight construction workers died as a result of being struck by an object in 2012. A number of these deaths may have been prevented if the workers had undergone proper training and used equipment and machinery properly.
- 3. Electrocutions :-** In 2012, 66 workers (9%) were seriously injured or killed by electrocution. Electrocution is when a person, tool or piece of equipment comes into contact with power lines or exposed electrical sources. Sometimes, these types of accident occur because workers are simply unaware of all energized power sources, from overhead and underground power lines to damaged receptacles and connectors.

4. Caught-in/between:- Although it seems obvious to never stand between a piece of heavy equipment and an immovable object, sometimes workers concentrating on their jobs find themselves in unexpected danger. Caught in/between accidents are when a worker's body part is caught, crushed, squeezed, compressed or pinched between two or more objects.

5. Slip and Falls :- These are among the most common accidents on a construction site. These accidents may be linked to unsafe conditions including uncovered holes or trenches and exposed stakes.

6. Ladder accidents :- This is one of the leading causes of injury and long-term disability. Most ladder accidents, including falls, happen because workers use the wrong type of ladder for their job or they set up the ladder improperly, perhaps on a slippery or unstable surface, and the ladder unexpectedly shifts or slips.

7.Scaffolding accidents :-Despite strict regulations, scaffolding accidents occur. In a Bureau of Labor and Statistics (BLS) study, 72% of workers injured in scaffold accidents attributed the accident either to the planking or support giving way, or to the employee slipping or being struck by a falling object.

8. Musculoskeletal disorders. A leading cause of injuries, disability claims and medical costs in construction are sprains and strains of the muscles. Construction work can also cause injuries to the joints, bones, and nerves. These injuries often stem from job demands that constantly wear and tear on the body.

9. Vehicle Accidents :- Dangerous construction site vehicles include forklifts, graders, backhoes and dump trucks. A common forklift accident occurs when the vehicle is turned or maneuvered with the load raised. Large trucks all too often back up and hit a pedestrian. Another hazard on construction sites is falling from a vehicle.

10. Power tool and machinery accidents :- Power tool and machinery injuries may occur for reasons that include mechanical defects, electrical failure, inadequate training and failure or lack of proper safety equipment. A significant number of injuries are caused by the use of power tools and large equipment.

While construction sites may appear to be dangerous, many of these accidents can be avoided through common sense and protective measures. Prevention begins with adequate awareness and a properly maintained working environment that is safe and secure.

CLASSIFICATION OF ACCIDENTS

Accidents can be grouped under the following headings:

1. According to the severity of the injury

Major accident

Minor accident

Accidental hazard

2. According to the nature of the injury

Death

Temporary disablement

Permanent disablement

Partial disablement

3. According to the cause of accident

Equipment fault

Construction site falls

Trench collapse

Crane failure

COST OF AN ACCIDENT

Construction worker injuries and illnesses have cost implications attached which, arguably, can have a major impact on a construction organization. It is not possible to insure against all the costs arising from accidents. However, it is possible to prevent accidents from occurring. Consequently, the costs of accidents can be avoided, time and money saved and harm to people prevented.

DIRECT AND INDIRECT COSTS

The costs of accidents can be categorized into direct and indirect costs. Various direct and indirect costs are associated with any accident and the extent of these varies with the severity of the consequences of an accident. Severity can range from minor accidents involving little or no absence from work to fatalities.

Direct Costs:- Direct costs tend to be those associated with the treatment of the injury arising from the accident and any unique compensation offered to workers as a consequence of being injured. These easily-identified expenses are known as the 'direct costs' associated with accidents

The direct costs are by and large covered by workmen's compensation insurance. Further, historical records can be reviewed to determine the expenditure attributed to each particular injury. Most of these costs are covered by workers' compensation insurance, such as medical expenses, lost wages, sick leave administration, temporary disability payments and hospitalization. However, others must be covered by the business itself. What may initially be classified as an inconsequential or minor accident, can prove to be immensely costly in terms of indirect costs.

Indirect Costs :-

Less evident expenses associated with accidents are known as "indirect" or "hidden" costs and can typically be several times greater than the value of the direct costs. Indirect costs include:

- reduced productivity for both the injured worker(s) upon returning to work and the crew or workforce;
- clean-up costs;
- replacement costs;
- stand-by costs;
- cost of overtime;

- administrative costs;
- replacement worker orientation;
- costs resulting from delays;
- supervision costs;
- costs related to rescheduling;
- transportation; and
- wages paid while the injured is idle.

The indirect or hidden costs usually exceed the direct costs. Indirect cost data is considerably more difficult to access than direct costs because the information is not often captured or quantified as it accrues.

These costs are usually several times greater than the insured or direct costs.

Examples of indirect costs that are usually not covered by insurance include:

- Overtime costs
- Time lost by injured employee
- Idle workers lost time
- Remedial work/correction
- Injured employee's productivity loss costs
- Supervision and management lost time
- Incident investigation costs
- Production loss and process delays
- Transportation costs
- Training of replacement employee(s)
- Additional medical costs
- Damage to equipment, plant, tools, or other property
- Idle plant and equipment
- Legal expenses
- Reduced morale
- Overhead cost borne by injured employee/family
- Negative image & Funeral Costs;

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*Thank
you!*

STAY HOME, STAY SAFE