



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A+’
Grade Approved by AICTE, New Delhi & Affiliated to Anna University,
Chennai



DEPARTMENT OF AEROSPACE ENGINEERING

19ASZ301– ROBOTICS & AUTOMATION IN SPACE

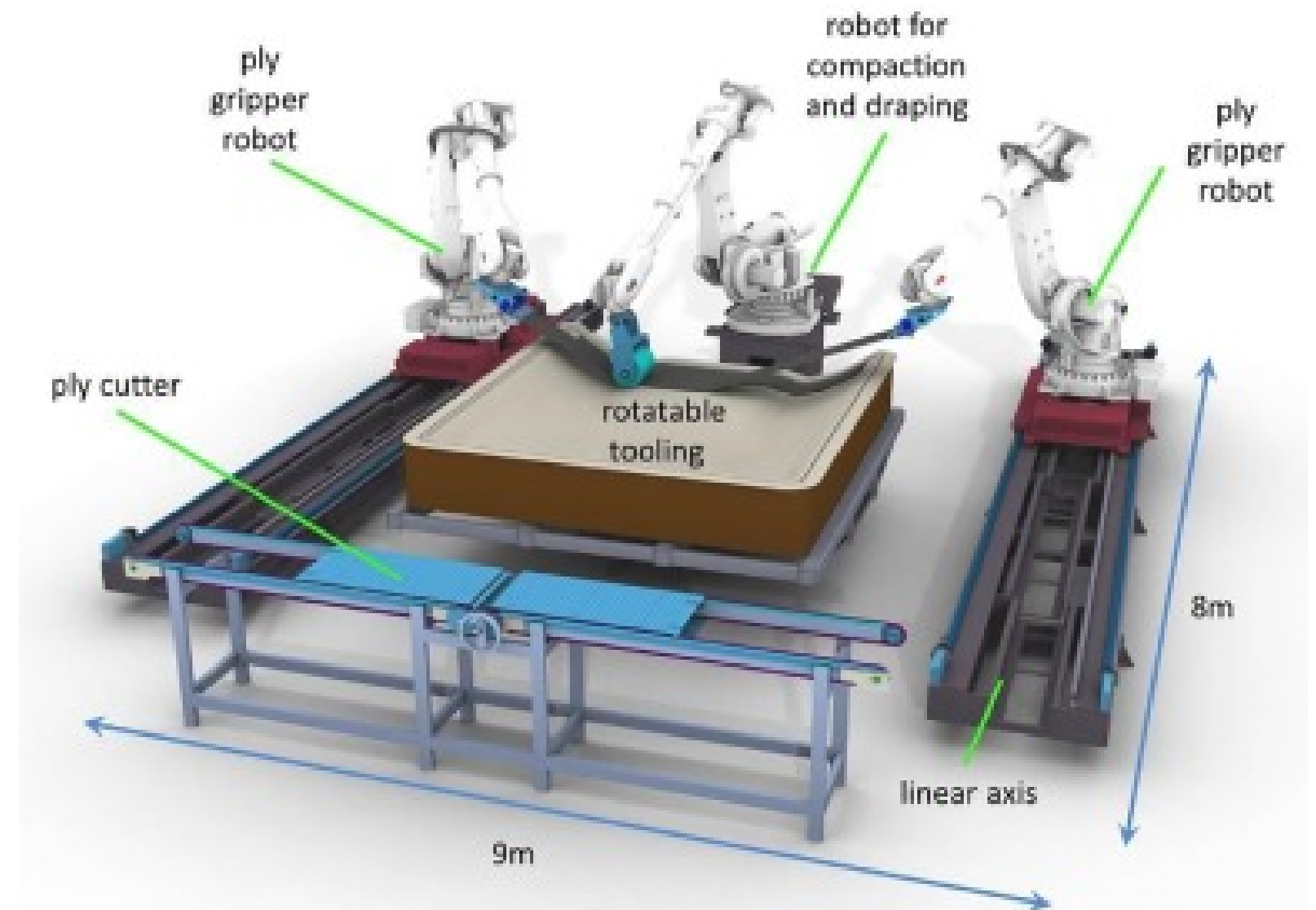
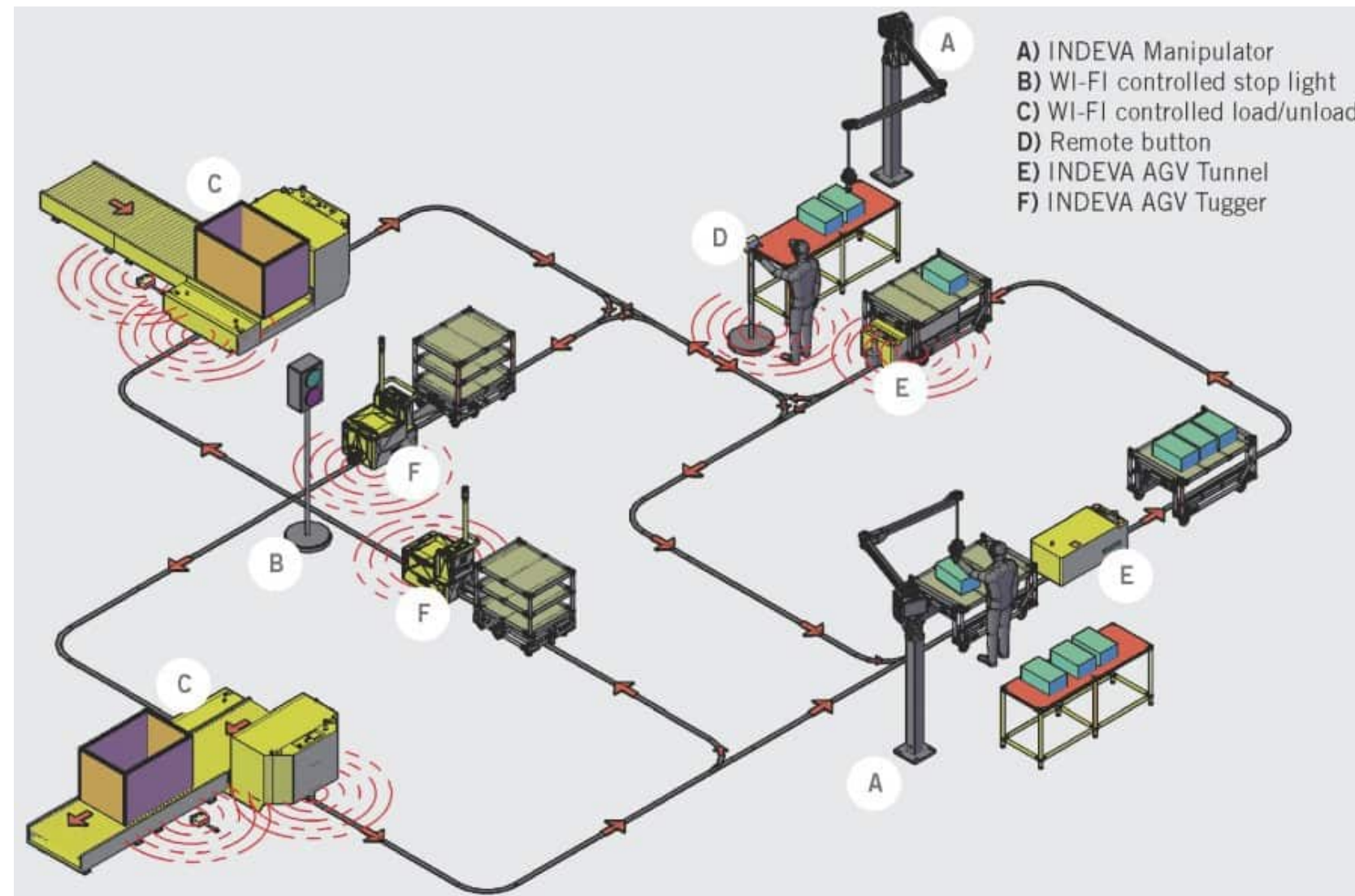
III YEAR VI SEM

UNIT 3 –MOTION CONTROL AUTOMATION

TOPIC - MATERIALS HANDLING SYSTEMS



MATERIALS HANDLING





TYPES OF MATERIALS HANDLING

Types of Materials Handling Systems

1. Manual Handling Systems

- Involves human effort with or without basic tools
- Examples: Trolleys, hand trucks, pallets
- ☒ Low cost, ☒ limited efficiency, prone to injury

2. Mechanized Handling Systems

- Use powered equipment for bulk movement
- Examples: Conveyors, hoists, cranes
- ☒ Medium speed, reliable, ☒ less flexible

3. Automated Handling Systems

- Integrated with sensors, controllers, and AI
- Examples:
 - AGVs (Automated Guided Vehicles)
 - AS/RS (Automated Storage and Retrieval Systems)
 - Robotic arms for pick-and-place
- ☒ High efficiency, reduced labor, ☒ high initial cost

Function	System Examples
Transporting	Conveyors, forklifts, AGVs
Positioning	Robotic arms, turntables, indexers
Unit Load Formation	Palletizers, shrink-wrappers, tote systems
Storage	Racks, carousels, AS/RS
Control/Identification	RFID, barcode scanners, sensor



ADVANTAGES

Key Components

1. Conveyors – Belt, roller, chain, screw types
2. Cranes & Hoists – For heavy-duty vertical handling
3. Forklifts & Pallet Jacks – Mobile, human-operated
4. AGVs/AMRs – Mobile robots for dynamic routing
5. Pick-and-Place Robots – For precise handling in production
6. Sortation Systems – Direct packages based on logic

Benefits of Efficient Materials Handling

- Reduced labor cost
- Increased throughput and productivity
- Minimized product damage
- Improved inventory control
- Enhanced workplace safety

Factor	Description
Load Type & Weight	Affects equipment capacity
Throughput Rate	Volume to be handled per unit time
Travel Distance	Short or long? Horizontal or vertical?
Flexibility Required	Need for changeover or expansion
Safety & Ergonomics	Minimize human effort and injury risk
Automation Level	Manual, semi, or fully automated



Thank You