
**University of Tabuk**

## Faculty of Engineering

**Mechanical Engineering Department**

# “Bachelor of Science in Mechanical Engineering Program”

## Field Training Companies List

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## Proposed 8-week time plans (Training Program)

**2023**

# 1 Introduction:

This report aims to provide an overview of the 8 weeks field/practical training activities undertaken by students enrolled in the Bachelor of Science in Mechanical Engineering program at the University of Tabuk. The training activities are carried out in collaboration with various companies and organizations, exposing students to real-world engineering practices and enhancing their practical skills. The following is a list of major training software, labs, workshops, and other activities in which the students have participated.

## 1.1 Operation and Maintenance Department at Tabuk Airport:

- Training activities include exposure to airport infrastructure, HVAC systems, fire protection systems, and maintenance procedures.

- Students gain practical knowledge in the field of aviation and airport operations.

## 1.2 Saudi Airlines Company for Aviation Engineering and Industry:

- Students engage in hands-on training related to aircraft maintenance, repair, and engineering.

- They work alongside professionals in the aviation industry, gaining insight into aircraft systems and maintenance practices.

## 1.3 Administration of King Abdulaziz City for Operation and Maintenance, Tabuk:

- Students participate in training programs focused on operation and maintenance practices in various sectors, such as utilities, infrastructure, and facilities management.

- They gain exposure to equipment maintenance, safety protocols, and technical troubleshooting.

## 1.4 Saudi Pharmaceutical Industries, Tabuk:

- Students receive practical training in pharmaceutical manufacturing processes, quality control, and equipment operation.

- They learn about Good Manufacturing Practices (GMP) and gain insights into the pharmaceutical industry.

## 1.5 Tabuk Agricultural Company (TADCO) in Tabuk:

- Students are exposed to agricultural machinery, irrigation systems, and farm management practices.

- They gain hands-on experience in agricultural engineering and farm operations.

## 1.6 Prince Muhammad bin Abdulaziz Airport in Madinah:

- Training activities focus on airport facilities management, including HVAC systems, electrical systems, and maintenance procedures.

- Students gain practical insights into airport operations and facility management.

## 1.7 Tabuk Spring Healthy Water Factory:

- Students receive training in the operation and maintenance of water treatment and bottling facilities.

- They learn about water quality control, purification processes, and production line operations.

## 1.8 Saudi Electricity Company in Madinah and Tabuk:

- Students participate in training programs related to electrical power generation, transmission, and distribution systems.

- They gain hands-on experience in power plant operations, electrical maintenance, and system troubleshooting.

## 1.9 Masdar Factory for the manufacture of solar panels:

- Students engage in training activities focused on solar panel manufacturing processes, assembly, and quality control.

- They gain practical knowledge in the field of renewable energy and solar technology.

## 1.10 Al Wajh Power Station:

- Students undergo training in power plant operations, including thermal systems, turbine operations, and control systems.

- They acquire practical skills in power generation and plant maintenance.

## 1.11 Tabuk Cement:

- Training activities involve exposure to cement manufacturing processes, machinery operation, and quality control measures.

- Students gain insights into the cement industry and its engineering requirements.

## 1.12 Maintenance Department at South Agency Company (Almajdouie):

- Students receive training in vehicle maintenance, including troubleshooting, repair procedures, and fleet management.

- They gain practical skills in automotive engineering and maintenance practices.

## 1.13 Border Guards:

- Training activities focus on the maintenance and operation of maritime vessels, including engines, propulsion systems, and navigational equipment.

- Students acquire practical knowledge in marine engineering and vessel operations.

## 1.14 SABIC Company in the Eastern Province and SABIC Yanbu:

- Students engage in training programs related to petrochemical manufacturing processes, equipment operation, and safety protocols.

- They gain practical insights into the petrochemical industry and its engineering practices.

## 1.15 Saudi Bin Laden Group- Al-Haramain Sector:

- Students receive training in construction project management, site supervision, and quality control measures.

- They gain practical experience in construction engineering and project execution.

# 2 Proposed 8-week field/practical training time plans

The following is the proposed 8-week field/practical training time plan for students of the Bachelor of Science in Mechanical Engineering program at the approved campanies.

## 2.1 Operation and Maintenance Department at Tabuk Airport:

## 2.2 Prince Muhammad bin Abdulaziz Airport in Madinah:

Week 1:

- Orientation and introduction to the airport's operation and maintenance department
- Safety training and familiarization with safety protocols at the airport
- Introduction to the department's maintenance software and tools
- Observation of maintenance activities and procedures

Week 2:

- Hands-on training on aircraft ground handling equipment
- Familiarization with aircraft systems and components
- Shadowing experienced technicians and engineers in their daily tasks
- Introduction to maintenance documentation and record-keeping

Week 3:

- Training on aircraft inspections and routine maintenance procedures
- Introduction to aircraft engine systems and components
- Hands-on experience with engine maintenance tasks under supervision
- Workshop on aviation regulations and compliance

Week 4:

- Introduction to avionics systems and their operation
- Troubleshooting and repair of avionics equipment
- Training on aircraft electrical systems and wiring
- Workshop on aircraft communication and navigation systems

Week 5:

- Advanced training on aircraft engine maintenance and troubleshooting
- Engine overhaul procedures and practices
- Familiarization with engine testing and diagnostics
- Workshop on engine performance analysis and optimization

Week 6:

- Training on aircraft hydraulic and pneumatic systems
- Hands-on experience with hydraulic system maintenance and troubleshooting
- Introduction to aircraft fuel systems and components
- Workshop on fuel system inspection and maintenance

Week 7:

- Introduction to aircraft structural maintenance and repair
- Training on composite materials used in aircraft structures
- Hands-on experience with structural inspections and repairs

- Workshop on aircraft corrosion prevention and control

Week 8:

- Final project or assessment related to aircraft maintenance
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

During the 8-week training period, students will have the opportunity to work closely with experienced technicians and engineers, gain hands-on experience with aircraft systems and maintenance procedures, and apply their theoretical knowledge in a practical setting. The training will provide them with valuable insights into the field of aviation engineering and enhance their skills and competencies in aircraft maintenance and operations.

## 2.3 Saudi Airlines Company for Aviation Engineering and Industry:

Week 1:

- Orientation and introduction to Saudi Airlines Company and its aviation engineering and industry division
- Safety training and familiarization with safety protocols specific to the company
- Introduction to the company's engineering software and tools
- Observation of maintenance and engineering activities at the facility

Week 2:

- Training on aircraft systems and components
- Hands-on experience with aircraft inspections and routine maintenance procedures
- Introduction to aircraft engine systems and their operation
- Workshop on aircraft maintenance documentation and record-keeping

Week 3:

- Training on aircraft avionics systems and troubleshooting
- Familiarization with avionics equipment and their maintenance requirements
- Hands-on experience with avionics system testing and diagnostics
- Workshop on aviation regulations and compliance specific to Saudi Airlines

Week 4:

- Advanced training on aircraft engine maintenance and repair
- Engine overhaul procedures and practices
- Hands-on experience with engine testing and performance analysis
- Workshop on engine efficiency and optimization

Week 5:

- Training on aircraft electrical systems and wiring
- Troubleshooting and repair of electrical components
- Introduction to aircraft communication and navigation systems
- Workshop on electrical system inspections and maintenance

Week 6:

- Training on aircraft hydraulic and pneumatic systems
- Hands-on experience with hydraulic and pneumatic system maintenance and troubleshooting
- Introduction to aircraft fuel systems and components
- Workshop on fuel system inspections and maintenance

Week 7:

- Introduction to aircraft structural maintenance and repair
- Training on composite materials used in aircraft structures
- Hands-on experience with structural inspections and repairs
- Workshop on corrosion prevention and control in aircraft structures

Week 8:

- Final project or assessment related to aviation engineering and industry
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

During the 8-week training period, students will have the opportunity to work closely with experienced engineers and technicians at Saudi Airlines Company. They will gain hands-on experience with various aircraft systems, develop practical skills in maintenance and repair procedures, and deepen their understanding of aviation engineering in a real-world setting. The training will provide valuable insights into the operations of a major aviation company and help students apply their theoretical knowledge to practical scenarios.

## 2.4 Administration of King Abdulaziz City for Operation and Maintenance in Tabuk:

Week 1:

- Orientation and introduction to the Administration of King Abdulaziz City for Operation and Maintenance and its various departments
- Familiarization with the facility layout and safety protocols
- Introduction to the software and tools used for maintenance and operation tasks
- Observation of ongoing maintenance activities and projects

Week 2:

- Training on operation and maintenance procedures for mechanical systems and equipment
- Hands-on experience with maintenance tasks, such as inspections, lubrication, and troubleshooting
- Introduction to computer-aided maintenance management systems (CMMS)
- Workshop on safety practices and risk assessment in maintenance operations

Week 3:

- Training on HVAC (Heating, Ventilation, and Air Conditioning) systems
- Understanding the design and operation of HVAC systems
- Hands-on experience with maintenance and repair tasks related to HVAC systems
- Workshop on energy efficiency and optimization of HVAC systems

Week 4:

- Training on electrical systems and equipment
- Understanding electrical diagrams and schematics
- Hands-on experience with electrical maintenance tasks, such as testing, troubleshooting, and component replacement
- Workshop on electrical safety procedures and regulations

Week 5:

- Training on plumbing and water supply systems
- Understanding the design and operation of plumbing systems
- Hands-on experience with maintenance and repair tasks related to plumbing systems
- Workshop on water conservation and sustainable plumbing practices

Week 6:

- Training on fire protection and safety systems
- Understanding the types and components of fire protection systems
- Hands-on experience with inspection, testing, and maintenance of fire safety equipment
- Workshop on emergency response and evacuation procedures

Week 7:

- Training on building automation systems
- Introduction to the control and automation of building systems
- Hands-on experience with programming and troubleshooting building automation systems
- Workshop on energy management and optimization using building automation systems

Week 8:

- Final project or assessment related to the operation and maintenance field
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to work alongside experienced professionals at the Administration of King Abdulaziz City for Operation and Maintenance. They will gain practical knowledge and skills in various areas of operation and maintenance, including mechanical systems, electrical systems, HVAC, plumbing, fire protection, and building automation. The training will provide them with a comprehensive understanding of facility management and equip them with the necessary skills to excel in their future careers as mechanical engineers.

## 2.5 Saudi Pharmaceutical Industries in Tabuk:

Week 1:

- Introduction to Saudi Pharmaceutical Industries and its manufacturing processes
- Orientation and safety training specific to pharmaceutical manufacturing
- Familiarization with the facility layout and standard operating procedures
- Introduction to the software used for process control and equipment monitoring

Week 2:

- Training on the manufacturing equipment used in pharmaceutical production
- Hands-on experience with equipment operation, maintenance, and troubleshooting
- Introduction to Good Manufacturing Practices (GMP) and quality control in the pharmaceutical industry
- Workshop on cleanroom protocols and aseptic techniques

Week 3:

- Training on process automation and control systems
- Understanding the principles of process control and instrumentation
- Hands-on experience with programming and troubleshooting of control systems
- Workshop on data analysis and optimization of manufacturing processes

Week 4:

- Training on pharmaceutical formulation and drug manufacturing processes
- Introduction to different dosage forms (tablets, capsules, liquids) and manufacturing techniques
- Hands-on experience with formulation development and quality assurance activities
- Workshop on regulatory requirements and compliance in the pharmaceutical industry

Week 5:

- Training on pharmaceutical packaging and labeling
- Understanding packaging materials, equipment, and labeling regulations
- Hands-on experience with packaging line operations and quality control
- Workshop on packaging design and serialization technologies

Week 6:

- Training on pharmaceutical utilities and facilities management
- Introduction to HVAC systems, purified water systems, and clean utilities
- Hands-on experience with maintenance and troubleshooting of utilities
- Workshop on energy management and sustainability in pharmaceutical manufacturing

Week 7:

- Training on quality control and assurance in pharmaceutical manufacturing
- Understanding analytical testing techniques and quality control procedures
- Hands-on experience with laboratory testing and analysis of raw materials and finished products
- Workshop on quality management systems (QMS) and documentation practices

Week 8:

- Final project or assessment related to pharmaceutical manufacturing processes
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of pharmaceutical manufacturing. They will learn about equipment operation, process control, quality assurance, and regulatory compliance within a pharmaceutical manufacturing environment. The training will provide them with valuable insights into the pharmaceutical industry

and equip them with the necessary skills to contribute to the development and production of pharmaceutical products.

## 2.6 Tabuk Agricultural Company (TADCO) in Tabuk:

Week 1:

- Introduction to Tabuk Agricultural Company (TADCO) and its operations
- Orientation and safety training specific to agricultural facilities
- Familiarization with the company's agricultural processes and equipment
- Introduction to agricultural software used for monitoring and control

Week 2:

- Training on farm machinery and equipment used in agricultural operations
- Hands-on experience with operation, maintenance, and troubleshooting of farm equipment
- Introduction to precision agriculture techniques and automation in farming
- Workshop on farm management practices and crop production systems

Week 3:

- Training on irrigation systems and water management in agriculture
- Understanding different irrigation methods and technologies
- Hands-on experience with irrigation system installation, operation, and maintenance
- Workshop on water conservation and efficient irrigation practices

Week 4:

- Training on agricultural machinery maintenance and repair
- Introduction to preventive maintenance schedules and techniques
- Hands-on experience with equipment diagnosis, repair, and calibration
- Workshop on equipment safety, lubrication, and parts replacement

Week 5:

- Training on greenhouse technology and controlled environment agriculture
- Understanding greenhouse structures, climate control, and crop management
- Hands-on experience with greenhouse operation, monitoring, and pest management
- Workshop on hydroponics and soilless cultivation techniques

Week 6:

- Training on post-harvest handling and food processing in agriculture
- Introduction to food safety standards and quality control measures
- Hands-on experience with post-harvest operations, sorting, and packaging
- Workshop on value-added food processing and preservation techniques

Week 7:

- Training on agricultural waste management and environmental sustainability
- Understanding waste disposal regulations and best practices
- Hands-on experience with waste management systems and recycling initiatives
- Workshop on sustainable farming practices and renewable energy in agriculture

Week 8:

- Final project or assessment related to agricultural engineering
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of agricultural engineering. They will learn about farm machinery, irrigation systems, greenhouse technology, post-harvest handling, and sustainability in agriculture. The training will provide them with valuable insights into the agricultural industry and equip them with the necessary skills to contribute to the development of efficient and sustainable agricultural practices.

## 2.7 Tabuk Spring Healthy Water Factory:

Week 1:

- Introduction to Tabuk Spring Healthy Water Factory and its operations
- Orientation and safety training specific to the factory's facilities
- Familiarization with the manufacturing processes of bottled water
- Introduction to quality control procedures and standards

Week 2:

- Training on the maintenance and operation of water treatment systems
- Hands-on experience with water purification methods and equipment
- Workshop on water quality analysis and testing techniques
- Introduction to software used for monitoring and controlling water treatment processes

Week 3:

- Training on the design and operation of bottling and packaging machinery
- Understanding the assembly line processes for bottling and labeling
- Hands-on experience with machine setup, maintenance, and troubleshooting
- Workshop on production optimization and efficiency improvement strategies

Week 4:

- Training on the facility's HVAC (Heating, Ventilation, and Air Conditioning) systems
- Understanding the design and operation of HVAC systems in a manufacturing environment
- Hands-on experience with system troubleshooting, maintenance, and repair
- Workshop on energy conservation and sustainability in HVAC systems

Week 5:

- Training on the facility's compressed air and pneumatic systems
- Introduction to compressors, air dryers, and distribution systems
- Hands-on experience with system maintenance, leak detection, and repair
- Workshop on pneumatic control systems and their applications

Week 6:

- Training on the facility's wastewater treatment and recycling systems

- Understanding the treatment processes and compliance with environmental regulations
- Hands-on experience with wastewater sampling, analysis, and treatment techniques
- Workshop on sustainable water management practices in industrial settings

Week 7:

- Training on the facility's electrical power distribution systems
- Introduction to electrical panels, motors, and control circuits
- Hands-on experience with electrical maintenance and troubleshooting
- Workshop on electrical safety standards and practices

Week 8:

- Final project or assessment related to a specific aspect of the factory's operations
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of mechanical engineering within a water bottling factory. They will learn about water treatment, bottling and packaging processes, HVAC systems, compressed air systems, wastewater treatment, and electrical power distribution. The training will provide them with valuable insights into industrial operations and equip them with the necessary skills to contribute to the efficient and sustainable production of bottled water.

## 2.8 Saudi Electricity Company in Madinah:

## 2.9 Saudi Electricity Company, Tabuk

Week 1:

- Introduction to Saudi Electricity Company and its operations
- Orientation and safety training specific to the company's facilities
- Familiarization with the electrical power generation, transmission, and distribution systems
- Overview of the company's maintenance practices and procedures

Week 2:

- Training on power plant operations and control systems
- Hands-on experience with power generation equipment, such as turbines and generators
- Introduction to software used for monitoring and controlling power plant operations
- Workshop on power plant efficiency optimization and performance analysis

Week 3:

- Training on electrical substations and switchgear systems
- Understanding the design, operation, and maintenance of substations
- Hands-on experience with switchgear installation, testing, and troubleshooting
- Workshop on substation automation and protection systems

Week 4:

- Training on electrical distribution networks and transformers
- Introduction to distribution system planning and load management

- Hands-on experience with transformer installation, maintenance, and testing
- Workshop on power quality analysis and voltage regulation techniques

Week 5:

- Training on electrical safety practices and procedures
- Understanding the hazards associated with working with high voltage equipment
- Hands-on experience with personal protective equipment and safety protocols
- Workshop on electrical safety standards and regulations

Week 6:

- Training on renewable energy systems, such as solar and wind power
- Introduction to the design, installation, and maintenance of renewable energy systems
- Hands-on experience with solar panel installation and maintenance
- Workshop on the integration of renewable energy into the power grid

Week 7:

- Training on energy management and efficiency improvement strategies
- Understanding the principles of energy auditing and conservation measures
- Hands-on experience with energy monitoring and analysis tools
- Workshop on energy-efficient equipment selection and retrofitting

Week 8:

- Final project or assessment related to a specific aspect of the company's operations
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of mechanical engineering within the Saudi Electricity Company. They will learn about power plant operations, electrical substations, distribution networks, electrical safety, renewable energy systems, and energy management. The training will provide them with valuable insights into the power industry and equip them with the necessary skills to contribute to the reliable and sustainable generation and distribution of electrical power.

## 2.10 Masdar Factory for the manufacture of solar panels:

Week 1:

- Introduction to Masdar Factory and its role in the manufacture of solar panels
- Orientation and safety training specific to the factory's operations
- Familiarization with the manufacturing process of solar panels
- Overview of quality control measures and standards in solar panel production

Week 2:

- Training on solar cell technology and materials
- Understanding the principles of photovoltaic (PV) systems
- Hands-on experience with solar cell fabrication techniques
- Introduction to software used for solar panel design and simulation

Week 3:

- Training on solar panel assembly and testing
- Hands-on experience with module assembly, soldering, and encapsulation
- Quality control and performance testing of solar panels
- Workshop on troubleshooting and repairing solar panel defects

Week 4:

- Training on solar panel installation and mounting systems
- Understanding the different types of solar panel mounting structures
- Hands-on experience with mounting systems installation and alignment
- Workshop on optimizing solar panel orientation and tilt angles

Week 5:

- Training on solar panel maintenance and cleaning
- Understanding the importance of regular inspection and cleaning
- Hands-on experience with maintenance procedures and equipment
- Workshop on diagnosing and resolving common solar panel issues

Week 6:

- Training on solar energy systems integration
- Introduction to grid-connected and off-grid solar systems
- Hands-on experience with system design and sizing
- Workshop on solar energy storage technologies

Week 7:

- Training on solar panel performance analysis
- Understanding the use of monitoring systems and data analysis
- Hands-on experience with data collection and interpretation
- Workshop on maximizing solar panel efficiency and output

Week 8:

- Final project or assessment related to solar panel manufacturing or applications
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of solar panel manufacturing and integration. They will learn about solar cell technology, panel assembly, testing, installation, maintenance, and performance analysis. The training will provide them with valuable insights into the renewable energy industry and equip them with the necessary skills to contribute to the advancement of solar energy technologies.

## 2.11 Al Wajh Power Station:

Week 1:

- Introduction to Al Wajh Power Station and its operations

- Orientation and safety training specific to the power station
- Familiarization with the different components of a power station (e.g., turbines, generators, boilers)
- Overview of the power generation process and equipment used

Week 2:

- Training on power plant instrumentation and control systems
- Hands-on experience with monitoring and control software used in power stations
- Introduction to data acquisition and analysis techniques
- Workshop on troubleshooting and diagnosing common issues in power plant operations

Week 3:

- Training on thermal power plant operations
- Understanding the principles of steam generation and turbine operation
- Hands-on experience with boiler and turbine maintenance procedures
- Workshop on optimizing thermal power plant efficiency and performance

Week 4:

- Training on electrical systems in power plants
- Understanding the basics of power generation, transmission, and distribution
- Hands-on experience with electrical equipment maintenance and testing
- Workshop on power system protection and safety measures

Week 5:

- Training on mechanical systems in power plants
- Introduction to pumps, compressors, and other rotating equipment
- Hands-on experience with equipment inspection, maintenance, and alignment
- Workshop on vibration analysis and condition monitoring techniques

Week 6:

- Training on environmental and sustainability aspects of power generation
- Understanding the regulations and standards related to emissions control
- Hands-on experience with environmental monitoring and compliance measures
- Workshop on renewable energy integration and power plant efficiency improvements

Week 7:

- Training on power plant maintenance planning and scheduling
- Introduction to predictive and preventive maintenance strategies
- Hands-on experience with maintenance software and documentation
- Workshop on outage management and coordination

Week 8:

- Final project or assessment related to power plant operations or equipment
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of power plant operations and maintenance. They will learn about power generation processes, equipment, control systems, and maintenance strategies. The training will provide them with valuable insights into the power industry and equip them with the necessary skills to contribute to the efficient and reliable operation of power plants.

## 2.12 Tabuk Cement:

Week 1:

- Introduction to Tabuk Cement and its manufacturing processes
- Safety orientation and training specific to the cement industry
- Familiarization with the different components of a cement plant (e.g., kilns, crushers, mills)
- Overview of cement manufacturing techniques and equipment used

Week 2:

- Training on cement production operations
- Understanding the raw materials used in cement manufacturing
- Hands-on experience with kiln operations and control systems
- Introduction to quality control and testing procedures in the cement industry

Week 3:

- Training on mechanical maintenance in a cement plant
- Hands-on experience with maintenance and troubleshooting of crushers, mills, and other equipment
- Workshop on lubrication techniques and best practices
- Introduction to condition monitoring and predictive maintenance strategies

Week 4:

- Training on electrical and instrumentation systems in a cement plant
- Understanding the basics of power distribution and control systems
- Hands-on experience with electrical equipment maintenance and troubleshooting
- Introduction to process instrumentation and control strategies

Week 5:

- Training on environmental and sustainability practices in the cement industry
- Understanding the regulations and standards related to emissions control and waste management
- Hands-on experience with environmental monitoring and compliance measures
- Workshop on energy efficiency improvements and alternative fuels in cement production

Week 6:

- Training on safety and risk management in a cement plant
- Introduction to safety protocols, procedures, and equipment
- Hands-on experience with hazard identification and risk assessment
- Workshop on emergency response and incident management

Week 7:

- Training on cement plant optimization and process improvements
- Understanding process parameters and optimization techniques
- Hands-on experience with data analysis and process optimization software
- Workshop on continuous improvement methodologies in the cement industry

Week 8:

- Final project or assessment related to cement plant operations or equipment
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of cement plant operations and maintenance. They will learn about cement production processes, equipment, quality control, and environmental practices. The training will provide them with valuable insights into the cement industry and equip them with the necessary skills to contribute to efficient and sustainable cement manufacturing.

## 2.13 Maintenance Department of South Agency Company (Almajdouie):

Week 1:

- Orientation and introduction to the Maintenance Department and its operations
- Safety training specific to the maintenance industry
- Familiarization with maintenance management systems and software used in the department
- Overview of different maintenance techniques and methodologies

Week 2:

- Training on preventive maintenance practices
- Understanding maintenance schedules and procedures
- Hands-on experience with inspection and maintenance of mechanical equipment
- Introduction to maintenance planning and work order management

Week 3:

- Training on predictive maintenance techniques
- Introduction to condition monitoring tools and equipment
- Hands-on experience with vibration analysis, thermography, and other predictive maintenance methods
- Workshop on data analysis and interpretation for predictive maintenance

Week 4:

- Training on equipment troubleshooting and diagnostics
- Hands-on experience with troubleshooting common mechanical faults
- Introduction to root cause analysis and failure analysis techniques
- Workshop on problem-solving and decision-making in maintenance

Week 5:

- Training on maintenance of hydraulic and pneumatic systems
- Understanding the principles and components of hydraulic and pneumatic systems

- Hands-on experience with maintenance and troubleshooting of hydraulic and pneumatic equipment
- Workshop on hydraulic and pneumatic system design and optimization

Week 6:

- Training on maintenance of rotating machinery
- Understanding the principles and operation of pumps, compressors, and turbines
- Hands-on experience with maintenance, alignment, and balancing of rotating equipment
- Workshop on lubrication practices and techniques for rotating machinery

Week 7:

- Training on maintenance of industrial vehicles and equipment
- Hands-on experience with maintenance and repair of forklifts, cranes, and other industrial vehicles
- Introduction to fleet management and maintenance strategies
- Workshop on safety considerations and regulations for industrial vehicles

Week 8:

- Final project or assessment related to maintenance practices or equipment
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of maintenance operations. They will learn about preventive and predictive maintenance techniques, equipment troubleshooting, and hydraulic/pneumatic system maintenance. The training will provide them with valuable skills and knowledge to contribute to effective and efficient maintenance practices in industrial settings.

## 2.14 Border Guards:

Week 1:

- Orientation and introduction to the role and responsibilities of the Border Guards
- Familiarization with safety protocols and regulations specific to border security operations
- Introduction to mechanical systems and equipment used by the Border Guards
- Basic training on vehicle maintenance and inspection

Week 2:

- Training on border security systems and equipment
- Hands-on experience with maintenance and troubleshooting of surveillance cameras, sensors, and alarms
- Introduction to software used for monitoring and managing border security systems
- Workshop on data analysis and interpretation for border security operations

Week 3:

- Training on maintenance and repair of patrol vehicles
- Hands-on experience with vehicle diagnostics and troubleshooting

- Introduction to preventive maintenance practices for patrol vehicles
- Workshop on vehicle maintenance and inspection techniques

Week 4:

- Training on maintenance and operation of marine vessels
- Hands-on experience with marine vessel maintenance and repair
- Introduction to marine navigation systems and equipment
- Workshop on maritime safety and emergency procedures

Week 5:

- Training on maintenance and operation of specialized border security equipment
- Hands-on experience with maintenance and troubleshooting of radar systems, communication devices, and other specialized equipment
- Introduction to equipment calibration and testing procedures
- Workshop on advanced technologies used in border security operations

Week 6:

- Training on maintenance and operation of surveillance drones
- Hands-on experience with drone maintenance, troubleshooting, and flight operations
- Introduction to aerial surveillance techniques and data analysis
- Workshop on drone safety and regulations

Week 7:

- Training on border security infrastructure maintenance
- Hands-on experience with maintenance and repair of fences, gates, and barriers
- Introduction to access control systems and electronic security measures
- Workshop on infrastructure inspection and maintenance procedures

Week 8:

- Final project or assessment related to border security operations or equipment
- Wrap-up sessions and review of the training program
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to gain practical experience in various aspects of border security operations. They will learn about border security systems and equipment, vehicle maintenance, maritime operations, and specialized equipment used in border surveillance. The training will provide them with valuable skills and knowledge to contribute to efficient and effective border security practices.

## 2.15 SABIC Company in the Eastern Province

## 2.16 SABIC Yanbu

Week 1:

- Orientation and introduction to SABIC Company, its operations, and safety protocols
- Familiarization with the company's mechanical engineering department and various engineering projects

- Introduction to software used for design and analysis in mechanical engineering, such as AutoCAD and SolidWorks
- Workshop on basic engineering calculations and problem-solving techniques

Week 2:

- Training on equipment maintenance and troubleshooting
- Hands-on experience with maintenance and repair of mechanical systems and machinery
- Introduction to predictive maintenance practices and condition monitoring techniques
- Workshop on maintenance planning and scheduling

Week 3:

- Training on manufacturing processes and equipment
- Hands-on experience with machining, welding, and fabrication techniques
- Introduction to quality control and assurance in manufacturing
- Workshop on process optimization and improvement

Week 4:

- Training on energy management and sustainability practices
- Hands-on experience with energy efficiency assessment and optimization
- Introduction to renewable energy systems and their integration into industrial processes
- Workshop on energy auditing and conservation

Week 5:

- Training on project management in mechanical engineering
- Hands-on experience with project planning, scheduling, and budgeting
- Introduction to risk assessment and mitigation strategies in project execution
- Workshop on effective communication and teamwork in engineering projects

Week 6:

- Training on automation and control systems
- Hands-on experience with programming and troubleshooting of PLCs (Programmable Logic Controllers)
- Introduction to HMI (Human-Machine Interface) systems and SCADA (Supervisory Control and Data Acquisition) systems
- Workshop on process automation and optimization

Week 7:

- Training on environmental health and safety practices
- Hands-on experience with hazard identification and risk assessment
- Introduction to safety regulations and compliance in industrial settings
- Workshop on emergency response and incident management

Week 8:

- Final project or assessment related to a specific mechanical engineering challenge or improvement opportunity within SABIC Company
- Presentation of the project outcomes and recommendations to the company's engineering team

- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to work on real-world mechanical engineering projects and gain practical experience in various areas, including equipment maintenance, manufacturing processes, energy management, project management, automation, and safety practices. The training will provide them with valuable skills and insights into the operations of a leading industrial company like SABIC.

## 2.17 Saudi Bin Laden Group- Al-Haramain Sector:

Week 1:

- Orientation and introduction to Saudi Bin Laden Group - Al-Haramain Sector, its operations, and safety protocols
- Familiarization with the mechanical engineering department and various projects within the sector
- Introduction to software used for design and analysis in mechanical engineering, such as AutoCAD and SolidWorks
- Workshop on basic engineering calculations and problem-solving techniques

Week 2:

- Training on construction site operations and management
- Hands-on experience with site layout, equipment selection, and logistics planning
- Introduction to building systems and mechanical installations
- Workshop on construction project planning and scheduling

Week 3:

- Training on HVAC (Heating, Ventilation, and Air Conditioning) systems
- Hands-on experience with system design, installation, and maintenance
- Introduction to energy efficiency and sustainable HVAC practices
- Workshop on HVAC system performance evaluation and optimization

Week 4:

- Training on plumbing and fire protection systems
- Hands-on experience with system design, installation, and maintenance
- Introduction to plumbing codes and regulations
- Workshop on plumbing system troubleshooting and repair

Week 5:

- Training on mechanical systems in buildings (elevators, escalators, etc.)
- Hands-on experience with installation, maintenance, and troubleshooting of mechanical systems
- Introduction to safety regulations and compliance in mechanical installations
- Workshop on mechanical system efficiency and reliability

Week 6:

- Training on renewable energy systems integration in buildings

- Hands-on experience with solar energy systems, wind turbines, or other renewable energy technologies
- Introduction to energy audits and feasibility studies for renewable energy projects
- Workshop on sustainable energy practices and system optimization

Week 7:

- Training on project management in construction engineering
- Hands-on experience with project planning, budgeting, and resource allocation
- Introduction to risk management and quality control in construction projects
- Workshop on effective communication and teamwork in engineering projects

Week 8:

- Final project or assessment related to a specific mechanical engineering challenge or improvement opportunity within Saudi Bin Laden Group - Al-Haramain Sector
- Presentation of the project outcomes and recommendations to the company's engineering team
- Evaluation and feedback from supervisors and trainers
- Certification or recognition of completion of the training program

Throughout the 8-week training period, students will have the opportunity to work on real-world mechanical engineering projects within the construction industry. They will gain hands-on experience in areas such as HVAC systems, plumbing and fire protection, mechanical installations, renewable energy integration, and project management. The training will provide them with valuable skills and insights into the operations of a prominent construction company like Saudi Bin Laden Group - Al-Haramain Sector.

# 3 Conclusion:

The field/practical training activities provided by the University of Tabuk for the Bachelor of Science in Mechanical Engineering students offer valuable opportunities to apply theoretical knowledge in real-world contexts. These training experiences, conducted in collaboration with various companies and organizations, enhance students' practical skills, expose them to industry practices, and contribute to their overall professional development. By bridging the gap between academia and industry, these training activities equip students with the necessary practical competencies to succeed in their future mechanical engineering careers.