DISCRIPTION

OF THEORY AND SCIENTIFIC SUPJECTS

INDUSTERIAL INSTITUTE
(SABAH AL-SALEM)

ITI

The Institute in Brief

The industrial Institute –Sabah AL-Salem was opened in 1992, it seeks to graduate a Technical national manpower trained through specialized technical training , provide the trainees with experiences which make them technicians and Ass. Technicians at high level of Competence in the Public and Private sectors .

The Institute set up special training programs to suit the labor market demands according to previous studies made by the Public Authority of Applied Education and Training in coordination with the German GTZ Corporation .

Institute Divisions

1- Electricity Division : Which includes the following specialtiess (Electrical connections –Power energy –Cooling and AC).

2- Electronics : includes (Radio and TV – Instruments and Automatic Control).

3- Cars Division : includes (Car Mechanic-Diesel Mechanic-Body shop – Cars electricity –Technical inspector).

4- Metals Mechanic (Metals Mechanic –Welding –Turning –and Operation Machines).

5- Construction Division.

6- General Subjects Division.

Study and training system

1- Study at the Institute is performed on three systems :

A- The First system : 3 years , 6 Semesters (Study + Training) he will be awarded a Certificate of Specialization in one of the Technical fields and his job Description shall be –Third Technical Specialist – Appointed at 6th Grade and Two allowances.

B- Second system : Fourth complementary year of two semesters (Theory Study) for those who ended 3 years to obtain the industrial secondary certificate . the said certificate was Accredited according to the MOE resolution issued on 10/ 2011 . It includes scientific and literary studies which are thought in the 4th secondary science classes (General Teaching) . This Complementary study is preceded by summer semester named Fourth Technician which is appointed at 6th Grade and Three allowances .

C- Third System : This study is designed for those who completed 4 years in the institute or graduates of Sceince Secondary education (General Teaching) . They are admitted to the section of Technical Inspector of the cars Division for 2 years after which they will be awarded post –secondary Diploma , appointed under 5 Grade with 3 allowances . The Institute management is endeavoring to have such system applied in all Specialties at the Institute .

Institute Location (Address)
Sabah AL-Salem area –Block 13
Phone Nos. : 25520037 - 25525800 - Fax : 25525700

First : ELECTRICAL ENGINEERING SECTION

Includes the Following Specializations

- Electrical Connections
- Electrical Powers
- Cooling & AC

Electrical Connections specialist :

A- Job Description of the electrical Connections Technician

1- Carry out electrical connections in different buildings

2- Installation of light equipment and fittings

3- Installation of electrical circuits controls

4- Installation and maintenance of Electrical Distribution panels and electrical Transformers .

5- Maintenance & Repair of household electrical appliances.

6- Carry out the works of ground cables such as joints and connections.

7- Using the automated control Technologies in electrical connections.

The Trainee should have knowledge in the safety and security rules which enable him to perform the above works with adequate skill.

B-Skills acquired :

1- Ability to perform electrical connections which include :

a- Different light Circuits.

b- Electrical sockets.

c- Bells , Roof Fans and Boilers Circuits.

2- Prepare electrical wires and cables to perform correct electrical connections .

3- Using the proper tools and electric instruments.

4- Connection of Contactors Circuits.

5- Ability to connect the control circuits of electrical engines.

C- Knowledge acquired from the theory materials :

I- Theory technology

1- Electricity Principles

2- Difference between relay and parallel connection

3- Elements of electric circuit

4- Study the difference between DC and AC current

5- Study 3-pahse current and the difference between star connection and triangle connection

6- Knowledge in quantities and accounts of internal lighting

7- Using the measuring tables in wiring

8- knowledge in Principles of Digital technologies

II- Applied Math's.

1- Knowledge in electric units and codes

2- Determine the relay and parallel Circuits in DC

3- Determine the relay and parallel Circuits in AC current

4- Technical account of electric Transformers

5- Difference in counting the star and triangle connection

6- Account of internal lighting

7- Account of wires sectors according to current type.

III- Engineering Drawing

1- Knowledge in technical terms used in the drawings according to the Kuwaiti standard specifications.

2- Knowledge in the dimensions of engineering shapes

3- Knowledge in drafting of electrical drawings

4- Knowledge in drafting of control circuits in engines.

5- 5-darfting of electric distribution Circuits

6- Knowledge in Digital Circuits

Electrical Powers Specialist

A- Job description of Electrical power Technician :

1- Assembly and Installation of Electric Generation Stations

2- Installation of Distribution Nets for high and Medium Tension

3- Installation of Control Circuits of different types of Electric Engines.

4- Installation and Maintenance of Distribution panels and Transformers .

5- Control of Electric capacity using semiconductors

6- Carry out ground cable works and different connections

7- Use of Automated Control technologies and logic controls

The Trainee should have knowledge in the safety and security rules which enable him to perform the above works with adequate skill.

B- Skills Acquired

1- Prepare suitable wires and cables for electric connections

2- Use of proper tools and electric instruments

3- Connect the Contactor Circuits and Relays

4- Ability to connect Control circuits to electric engines

5- Ability to wind up electrical engines of different types

6- Maintenance and connection of single and 3 phase electric transformers

7- Digital Control of electric engines

C- Knowledge acquired from theory study

I- Theory technology

1- Electrical basics.

2- Difference between relay and parallel connection.

3- Elements of electric circuit.

4- Study the difference between DC and AC current.

5- Study 3-pahse current and the difference between star connection and triangle connection.

6- Knowledge in electrical engines and Generators.

7- Types of electric switches.

8- Method of operation of spare energy.

9- Principles of digital technologies and programming.

10- Types of power stations.

II- Applied Math's

1- Knowledge in electric units and codes.

2- Determine the Relay and parallel Circuits in DC.

3- Determine the relay and parallel Circuits in AC current.

4- Technical account of electric Transformers.

5- Difference in counting the star and triangle connection.

6- Account of internal lighting.

7- Account of wires sectors according to current type.

III- Engineering Drawing

1- Knowledge in technical terms used in the drawings according to the Kuwaiti standard specifications.

2- Knowledge in the dimensions of engineering shapes.

3- Knowledge in drafting of electrical drawings.

4- Knowledge in drafting of control circuits in engines.

5- Drafting of electric distribution Circuits.

6- Knowledge in Digital Circuits.

Cooling & AC Specialist

A- Job Description of Cooling and Ac Technician

1- Installation and assembly of different cooling units.

2- Maintenance , testing and repair of different cooling units.

3- Perform measurements to protect against noise and corrosion and insulation technology.

4- Connection of electronic components and electrical connection of Cooling and AC Units.

5- Maintenance , testing and repair of cooling Units.

The Trainee shall learn the knowledge and skills of modern electrical and electronic concepts in addition to Control systems and thermodynamic Technology.

B- Skills acquired

1- Carry out different mechanical operations for Cooling & AC.

2- Oxygen –Acetylene welding using copper and tin.

3- Carry out simple plumping for cooling and AC systems.

4- Needing and forming of gas and water Pipes.

5- Use testing and measuring equipment for cooling and AC systems.

6- Dismantle and installation of Cooling Compressors of closed and opened types.

7- Dismantle , repair and install of mechanical parts of the Refrig. And window AC , Car AC .

8- Dismantle and install of cooling circuits such as pressure regulators and valves .

9- Periodic maintenance of AC and Chillers.

C- Knowledge acquired from theory study

I- Theory technology

1- Knowledge in methods of different electrical measurements

2- Knowledge in parts of basic cooling and Ac equipment and their functions in the cooling process.

3- Knowledge in cooling devices used in Cooling and AC

4- Knowledge in Control tools used in the Cooling circuit

5- Knowledge in safe use of the Cooling and AC equipment

II- Applied math's :

1- Knowledge of the basic calculations of the profession and measurement Units.

2- Calculations of time units , angles , spaces and volume

3- Knowledge in calculations of pressure and gas reaction

4- Knowledge in calculations of thermal transmission , cooling loads and cooling rooms

5- Knowledge in calculations of air ducts and distribution

6- Knowledge in calculations of thermal loads of buildings

7- Knowledge in calculations of cooling capacity and selection of suitable cooling for places .

III- Engineering Drawing

1- Knowledge in electrical Circuits of Refrig's , Coolers , Window Ac and split units .

2- Knowledge in drawings of electrical circuits for operation of assembly units and chiller operation .

3- Drawing of light Circuits with Control Switches

4- Knowledge in diagrams of cooling Circuits and thermal exchangers

5- Knowledge in drawings of air ducts and single metal panels .

6- Drawing of air ducts distribution , and cooling cycle in the Buildings Drawings .

Second : ELECTRONICS SECTION

Includes the Following Specializations :

- **Radio & TV**
- **Instruments and Automatic Control**

1-Job Description of the Automatic Control Technician

Should be able to install , operate and maintain all instruments and control devices working in the different production factories which include (Oil – Metal –Construction- Medical –Foods –Services …etc).

2-Skills acquired From science Curricula :

- Basic electrical and mechanical skills.
- Ability to install electronic Circuits.
- Ability to install electric engines Circuits.
- Ability to install and operate Pneumatic and hydraulic controls.
- Ability to install and operate PLC System.
- Ability to caliber the pressure , quantity and Temperature equipment in addition to speed and Control.

3-Knowledge acquired from theory subjects :

A- Theory technology

- Knowledge in the basic concepts of electricity and features of insulated and conductive materials .
- Electronic elements and method of operation.
- Installation and operation of electrical engines.
- Installation and operation of Pneumatic and Hydraulic Control Circuits.
- Install and operate PLC System.
- Knowledge in different quantity survey equipment through PID Controller.

B- Applied Math's :

- Knowledge in basic applied maths for basic electrical and electronic Elements .
- Knowledge in basic applied maths for Pneumatic and Hydraulic Digital Circuits .
- Knowledge in basic applied maths for Pressure and Temperature Equipment .

C- Engineering Drawing

- Ability to perform basic skills in Engineering drawing.
- Ability in electric, electronic , hydraulic plotting.
- Ability to plot Digital control Systems , measuring and control circuits.

1- Job Description of the radio &TV Technician

The Radio and TV Technician should be able to install , Operate and Maintain TV , Radio , Electronic circuits and communication equipment .

2- Skills acquired from the practical study :

- Basic electrical and mechanical skills.
- Ability to verify and test electronic elements.
- Ability in trouble shooting , repair of electronic circuits , radio , TV and Communication devices .
- Ability in the correct use of the different test and measuring equipment .
- Ability to replace and welding of electronic elements and protect them against damages.

- Ability to install Transmission and receiving Circuits
- Ability to use integral and logical Circuits

3- Skills acquired from theory subjects

A- Theoretical Technology

- Knowledge in the basic concepts of electricity and materials qualities.
- Nudge in the Circuits of AC , resonance Circuits and their applications in the radio and TV Circuits.
- Knowledge in semi conductors , electronic elements , frequencies and ability to operate them .
- Knowledge in the transmission , receiving and communication Technology.
- Knowledge and use of integrated and logical Circuits

B- Applied Math's :

- Knowledge in basic maths
- Knowledge of applied maths in DC and AC Circuits
- Knowledge in applied maths and elements of electronic circuits
- Knowledge in applied maths For communication technology

C-Engineering Drawing:

- Ability to perform basic skills in Eng. Drawing
- Ability in plotting of electrical, electronic and Digital Circuits
- Ability to read Radio and TV diagrams .

Second: AUTOMOBILE ENGINEERING SECTION

Which includes the following specialization:

1. Car Mechanics (Petrol).
2. Diesel Mechanics.
3. Car Electric.
4. Car Body work.
5. Technical inspector.

Car Mechanics (Petrol)

A) Functional Description: Car Mechanics (petrol) Technician. He should be able to works in the field of repairing and maintaining car engines.

1. Repair four wheel vehicles.
2. Specify common failures and fix them.
3. Do hydraulic, simple electrical and electronic maintenance of car.
4. Use the information from the manual / catalogue of the car in fixing and maintaining it.
5. Use the drawing diagrams and tables.
6. Manage the work and write the note.
7. Direct and estimate, paying attention to safety rules.

B) Skills from practical training:

1. Ability to maintain and fix the motor comprising.
2. Do complete and comprehensive repair of the petrol engine.
3. Getting the engine out of the car.
4. Using standard or special tools and different modem devices, say the condition of the engine.
5. Follow safety rules during work, especially when using levers.

C) Knowledge gained through theoretical curriculum:

I - Theoretical Technique.

Theoretical technique will help the trainee to know:

1. 1 The engine parts and operation.
2. 2 The different petrol engine systems.
3. The electrical system connected to the engine.
4. The cooling and oiling system.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1. Technical calculations related to the job.
2. Calculations of the engine (volume, pressure, rate, etc).
3. Calculations of clutch, pressure, etc.

III - Geometric Diagram:

Study of the Geometric Diagram will help the trainee to:

1. Know the main principles and to use drawing tools.
2. Draw the three projections for different parts of the car «sections drawing».
3. Draw the perspective from the three projections.
4. Draw the different electric circuits with the use of its symbols.

Diesel Mechanics

A) Functional Description: Diesel Mechanics Technician.

1) The diesel Mechanics technician works in the field of car repairing and diesel engine maintenance that are used in the units of electric generators, transports, buses and other vehicles, ships, tractors, etc.

2) He should specify the common problems and repair them.

3) His activity comprises of fixing of hydraulic systems, air systems, new electronic systems that are related to diesel motors.

4) He should be able to use the information from the technical drawings that are found in the catalogue, and use them in the maintenance and repairing of the engines.

5) He should be able to use the drawing diagrams and tables.

6) He should be able to manage the work and write the note.

7) He should be able to direct and estimate, paying attention to safety rule.

B) Skills gained from practical training Curriculum:

The ability of maintenance, fixing, and reconditioning the diesel engine and this comprises of the following:

1. Making complete repair of the diesel engine.
2. Maintaining and repairing the petrol carriers and examining them by the particular Sets (reinforcement pump, petrol pump and its kinds).
3. Using standard or special tools and different modem devices, say the condition of the engine.
4. Follow safety rules during work, especially when using levers.

C) Knowledge gained through theoretical Curriculum:

I - Theoretical Technique:

Theoretical technique will help the trainee to know:

1. The engine parts and operation.
2. The different diesel engine systems, pumps, etc.
3. The electrical system connected to the diesel engine.
4. The cooling and oiling system.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1. Technical calculations related to the job (symbols, units, etc).
2. Calculations of the engine (volume, pressure, rate, etc).
3. Calculations of clutch, pressure, etc.

III - Geometric Diagram:

Study of the Geometric Diagram will help the trainee to:

4. Know the main principles and to use drawing tools.
5. Draw the three projections for different parts of the car «sections drawing.»
6. Draw the perspective from the three projections.
7. Draw the different electric circuits with the use of its symbols.

Car Electric

A) Functional Description: Car Electric technician. He should be able to:

1) Work in the field of repairing and maintaining car electrical system, circuits, in addition to mechanical, electronic and hydraulic systems.

2) Know the rules used in building parts and components of the automotive system and rules for calculating and estimating the car electrical system.

3) Use the measurements with the help of computer.

4) Manage the work and write the note.

5) Do good planning. Good behavior, economical thinking and reducing waste are

6) Also important

7) 6) Follow security and safety rules to avoid accidents.

B) Skills from practical training:

Ability to maintain and fix the motor comprising as the following:

1. Do complete and comprehensive repair, maintenance, reconditioning of car parts like: dynamo, starter, lighting circuits, car radio, car AC, electronic lighting, break computer, electronic fuel injection, etc.
2. Correct use of examining sets and keeping them.
3. Using standard or special tools and different modern devices, say the condition of the engine and specify the failure or» the parts.
4. Follow safety rules during work.

C) Knowledge gained through theoretical curriculum:

I - Theoretical Technique.

Theoretical technique will help the trainee to know:

1. The basics of electricity.
2. About the components and electronic elements.
3. About the electric, electronic circuits and electric sets in the car.
4. About the electronic injection and the system of electronic flaming.
5. About the tools like aphometer, ammeter, etc.
6. About the common failures in the above mentioned sets.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1. Electronic and electrical calculations.
2. Battery capacity calculations, power and working of the dynamo.
3. Calculations of the engine/motor (capacity, working, power, etc).

III - Geometric Diagram:

Study of the Geometric Diagram will help the trainee to:

1. Know the basic principles and to use drawing tools and dimensions.
2. Know the electronic symbols and terms used in electric and electronic circuits.
3. Know the drawing of different electric circuits for the car using its symbols.
4. Draw the perspective from the three projections.

Car Body Work

A) Functional Description: Car Body Work technician. He should be able to:

The Car Body Work technician uses his skills in the following:

1) Maintenance and fixing all things related to the car body.

2) Fixing the damage caused by accidents and damages caused by the weather.

3) Building and reconditioning the body for the vehicles (buses) by using car body.

4) Use paint to protect the body parts from corrosion.

5) All these need more and higher skills. Practice will increase these skills.

6) Knowledge of special tools and motors specified forthis kind of work.

7) Good planning to get the achieved result.

8) Economic thinking and reducing loss in materials.

9) Follow safety rules to avoid accidents.

B) Skills from practical training:

Ability to maintain and fix following:

1) Do complete and comprehensive repair and maintenance of damages and corro sion of car body.

2) To straighten the car body by using the special tools.

3) To paint the car and use the painting materials and machines for this purpose.

4) Using painting inside the painting furnace.

5) Using different kinds of welding processes.

6) Cutting and forming the sheet iron by tools for the car body.

7) Following the rules of safety and security.

C) Knowledge gained through theoretical curriculum

1) Theoretical Technique.

Theoretical technique will help the trainee to know:

1) About metal sheets and welding works.
2) About cutting, bending and expansion methods.
3) About the strength and straightening the metal.
4) About all kinds of welding.
5) About corrosion and resisting it.
6) About dyes and painting the car.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1) Technical calculations related to the job and its symbols.
2) Calculations, length, volume, mass and weight.
3) Calculations of cutting speed, wheel, etc.
4) Integrated constructing calculations.

III - Geometric Diagram:

Study of the Geometric Diagram will help the trainee to:

1) Know the basic principles and to use drawing tools and dimension tools.

2) Draw simple projection forms and perspectives.

3) Know and apply geometric exercises (polygons, trends, oval, frames, and spirals).

4) Know drawing cylindrical, conical, inclined (bent) and prismatic figures.

5) Draw the pyramidal figures, cross sections, etc.

6) Reading the diagram of the electrical circuits for the car.

Technical inspector (Cars)

Description of Specialty materials (Theory /Practical)

Introduction :

In 2014 , in the second semester at the end of January , the institute started to receive students for the profession of (Technical Inspector) for two years study, and shall be awarded of Post secondary Diploma. They will be able to test the vehicles operated on both systems (Gasoline and Diesel) in addition to testing the parts of vehicles , evaluate their competence which will enable them to form groups which can determine the vehicle competence .

Description of the subject of specialty for (Car inspector) :

First : Applied mechanics

1- knowing the parts of the engine (chassis – Engine – Transmission- back Axel –suspension –safety systems (brakes –seat belts and Air bags.

2- Knowing the different system which operate the vehicle (ignition systems –Cooling sytem – oiling system.

3- Knowing the engine fuel system and ignition system for Gasoline and diesel.

4- Knowledge in the electric and electronic Circuits

5- Knowing the theories of Transmissions (manual –Automatic).

Second : Applied Math's

1- knowing the applied technical calculations related to codes and units.

2- knowing of engine system (engine capacity –Pressure –torque – ability and competence).

3- knowing the limits of clutch and brakes

4- distances synchronized with speeds –(time for passing the distance and speed count) , sudden stop with loads , types of resistances faced by the vehicles.

Third : Engineering Drawing

1- Basic principles of engineering drawing , use of drawing tools and rules of 3 dimensions.

2- Drwaing of Dimensions (3D) of different parts of the engine and the sections.

3- Drawiing of different electrical and electronic Circuits and use of symbols .

4- Computer drawing (solid work).

Fourth : Workshop and operation Technology

1- Dismantling and assembly of engines operated by the two systems (Gasoline /Diesel).

2- Knowledge in maintenance of vehicles parts

3- Diagnose of failures and repairs

4- Maintenance and repair of Hydraulic systems in vehicles.

5- Maintenance of electrical and electronic parts

6- Use of different testing appliances

7- Knowing and the use of technical details related to the vehicles parts according to the Catalogue.

8- Maintenance logs and data recording

9- Ability to manage the testing tasks , and write of remarks

10- Ability to instruct and value works results observing the safety and security rules .

Fifth : Computer

1- Knowledge in basics of operation and parts of Computer

2- Knowledge in Computer software (Microsoft office) and methods of application.

3- Typing and coordination of official letters and correspondence

4- Educational films : Video maker , power point , solid works and Auto Cad.

Sixth : Traffic law

1- Knowledge in Traffic rules

2- Knowledge in safety and security of vehicles.

3- Knowledge in dealing with others and PR.

4- Knowledge in the traffic fines ‘

5- Knowledge in the laws applicable in Kuwait , GCC related to vehicles evaluation and safety and security rules.

Seventh: General chemistry

Includes Branches , Symbols , Formulas and Chemical Calculations , Oxidation , Organic Chemistry , Acids , Electrical Chemistry and Electronic cells .

Eighth : English language

Includes grammar , conversations , written and linguistic skills and knowing of names of quantity parts .

Ninth : Thermodynamics

It includes teaching the qualities of thermal transmission of its different types to different energy forms such as the change of thermal power into mechanical energy (engines of vehicles called internal Combustion). Also the transforming of thermal energy into electrical energy (power stations and electric Generation) also the transfer of kinetic energy into electric energy and to study the rules of Thermodynamics.

Tenth: Basic Hydraulic

Knowing the quantity of proper oils , Fluids flow to be used in determining the proper lifts and adequate quantities for such lifts , knowing the hydraulic installations used in the rain water distribution networks , shifting the sediments on roads being a task of the traffic Engineers .

11th : Fuel &oil

Knowing the sources and types and uses of fuels and oils.

Third: MECHANICAL ENGINEERING SECTION

Which includes the following Specialization:

1. General Mechanics.
2. Mechanical Operations.
3. Welding Mechanics.

General Mechanics

A) Following is the functional description of the general Mechanics technician:

He should acquire the theoretical and practical knowledge by attending the classes and fully equipped workshop. He should have the ability and skills necessary for doing his work independently basing upon the knowledge he had acquired from the Institute. He should have the ability to:

1) Do all the manual operation in cutting, framing and welding, etc.

2) Do the building, making, initial operation and maintenance and repair the splinter›s machines:

3) Do the making, maintenance, repairing, operating and changing the transport means (transporting belts, etc) and lifting machines.

4) Repair maintenance and fixing common failures for systems that work by hydraulic and pressed air.

5) Examining, building initial operating in the fields of:

- Measurement, Examination, Weighing Equipment
- Office technical equipment
- Optician and medical equipment

6) Do simple works in plumbing. The trainee in this section should learn the skills, knowledge in modern mechanical fields that help him to do the works of high technology. He should take into consideration the safety rules.

B) Skins gained from practical training curriculum:

A trainee should have the ability to:

1) Do basic tests through correct use of tools and devices of measurements.
2) Choose correctly the material according to the properties and use.
3) Choose correctly the production style (manual and automatic) for metal and plastic material.
4) Fix and disassemble motors and equipment in the right way.
5) Choose and carry out the suitable methods for the best implementation of the work.
6) Identify danger and strictly obey the safety rules to avoid any kind of dangers while using machines, tools, etc.

C) Knowledge gained through theoretical curriculum:

I - Theoretical Technique:

Theoretical technique will help the trainee to know:

1) Establishing sets and equipment tools for measurement.
2) About the methods for metal production and plastic production.
3) About the combined measurement for metals and non-metal materials.
4) About the basic rules the basic rules for measurement process.
5) The basic rules for and methods for metal operation processes (cutting and conducting) manually or automatically
6) About the basic rules for building the motors for the main workshops.
7) About the basic rules to choose metal and non-metals (plastic).
8) About the heat treatment for iron material.
9) About the basic principles for levers, hydraulic and compressed air systems.
10) About the basic rules for pipes linking and hoses.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1) Basic calculation processes and use of manual computer.
2) Quantity calculation and use necessary theories practically.
3) Effective power on the mechanical parts.
4) Applying mathematics relations to the necessary calculation in different production processes.

III• Geometric Drawing:

Study of the Geometric Drawing will help the trainee to learn:

1. The basic rules for mechanical drawing.
2. Basic drawing rules for essential mechanical parts.
3. Technical symbols, terms used in different mechanical drawing fields. 4 To read complete mechanical and explaining the job of the parts that forms it.
4. To draw the parts needed to be produced according to technical qualifications.
5. About drawing procedures for producing simple work pieces by Splinters machine.

Mechanical Operations

A) The functional description for the Mechanical Operations Technician are:

1) Doing the manual skills in cutting, forming and welding, etc.
2) Use old and new operation machines controlled by computer, in the production.
3) Preparing the motors and tools according to the technical specifications.
4) Controlling production procedure.
5) Testing the Wrought quality during production processes.
6) Maintaining the accuracy of the final products.

A trainee in this field should learn the skills and knowledge in new mechanical engineering field that helps him to do all work of superior technology. He should take necessary care of the safety and security rules.

B) Skills gained from practical training curriculum:

A trainee should have the ability to:

1) Do the basic tests in the proper use of tools and measurement sets.
2) Choose correctly the materials according to their properties and use.
3) Choose and carry out production methods (manual and automatic) for metal and non-metal materials.
4) Disconnect and connect tools and motors in the proper way.
5) To make sure that the products work properly.
6) To recognize and avoid dangers and accidents.

C) Knowledge gained through theoretical curriculum

I - Theoretical Technique.

Theoretical technique will help the trainee to know:

1. The basic rules for the measurement process.
2. Basic rules for fixing sets and tools of measurement.
3. The major rules for metal and non-metals products.
4. The measure unification of metal and non-metal materials.
5. Basic rules for manual and automatic operation.
6. Basic rules for installing stropping, polishing and fabrication machines.
7. Basic rules for choosing metal and non-metal (plastic) materials.
8. Heat treatment for steel (iron) materials.

II - Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1. Basic calculation processes and use of computer.
2. Quantum physics calculations and using the Pythagorus theory, practically.
3. Calculation for effective powers on the mechanical parts.
4. Applying mathematical theories related to different production processes.

III - Geometric Drawing:

Study of the Geometric Drawing will help the trainee to learn:

1. The basic rules for mechanical drawing.
2. Rules for drawing basic mechanical parts in the field of the job:
3. The symbols and technical terms used in the field of different mechanical drawings.
4. To read complete mechanical drawing and describing the work according to it.
5. To draw the parts needed to be produced according to the technical specifications.
6. The drawing procedure steps for producing simple work pieces using splinters machines.

Welding Mechanics

A) The functional descriptions for the Welding technician are:

Carrying out the welding works on steel materials according to the international standards (ISO) which include the following:

1) Building tanks.
2) Boiler vessels.
3) Steel structures.
4) Bridges.
5) Under-water structures.
6) ,Pipe lines for oil industry.
7) Ship industry.
8) Vehicles and containers.
9) Making tests for the damaged parts to decide whether they are/ good or not according to the international standards. In this field the trainee should learn the new skills and knowledge which help him to do the work of high technology taking safety rules into consideration.

B) Skills gained from practical training curriculum:

A trainee should have the ability to:

1) Do the work neatly using the proper tools.
2) Choose the proper materials considering their properties.
3) Choose and carry out production methods (manual and automatic) for metal and non-metal materials.
4) Do the various welding processes.
5) Do the cutting processes according to the international standards.
6) Do tests on the welded parts according to the ISO standards.

7) To prepare and carry out the test related to the welding to procure the international certificate.

C) Knowledge gained through theoretical curriculum

I - Theoretical Technique.

Theoretical technique will help the trainee to know:

1. The basic rules for the measurement process.
2. Basic rules for fixing sets and tools of measurement.
3. Basic rules for producing metals and non-metal materials (plastic).
4. The measure unification of metal and non-metal materials.
5. To make test to know whether they are damaged or not on metals and welded parts.
6. Heat treatment for steel (iron) materials.
7. The welding defects.
8. Basic rules to select a welder.

II - Applied Mathematics

Study of the Applied Mathematics will provide the trainee knowledge of:

1. Basic calculation processes and use of computer.
2. Quantum physics calculations and using the Pythagorus theory, practically.
3. Calculation for effective powers on the mechanical parts.
4. Applying mathematical theories related to different production processes.

III - Geometric Drawing:

Study of the Geometric Drawing will help the trainee to learn:

1. The basic rules for mechanical drawing.
2. Rules for drawing basic mechanical parts in the field of the job.
3. And to explain the couple systems and symbols of welding connectors according to the ISO.
4. And to explain the complete the welded parts.
5. How to make a plan for a complicated part.
6. Producing work pieces using splinter machines.

Fourth: CARPENTRY AND DECORATION SECTION.

Carpentry And Decoration

Carpentry with interior and exterior decoration

A) The functional description of the decoration and carpentry technician:

He should acquire the theoretical and practical knowledge by attending the classes and fully equipped workshop. He should have the ability and skills necessary for producing and building house and office furniture independently basing upon the knowledge he had acquired from the Institute.

1) A successful graduate should be able to use the manual and electrical carpentry tools for cutting the wood in required sizes. He should arrange all the materials for building. He should also know different kinds of wood and combine those together.

2) Special abilities› are required from the trainee to use the manual and electric carpentry tools, rotative and stationary. He also should choose suitable machines to carryout the work successfully. These skills can be acquired by following the instructions from the m instructor.

3) Discipline is the most important basic rule for producing wood products of high quality. The trainee should use tools taking safety rules into consideration.

4) A trainee should be fully aware of skills related to carpentry: how to keep the wood, paint and join them using the suitable adhesive material.

5) He should be always ready to change according to the changes in the civilization and according to the needs of the time. He should have an eye on the market where new materials arrive and using them will keep him ahead of other carpenter mechanics.

B-Tasks carried out by the Constructions section

1- Manual Work Section : it includes tables (Wooden desks) for the manual tools in which the trainee can adapt to acquire the manual experience for the work .

2- Electrical machines and Tools : this section includes all machines to perform the Carpentry works easily and rapidly . the Trainee is prepared for the use of such tools in terms of theory and practice by Trainers specialized in the Technical and academic field .

3- paints section : in this section , the work done by the trainee shall be completed for the Final stage before the marketing process by applying the paint coating through proper equipment for the production process under the supervision of the Training staff.

4- theory section : in this section , the Trainee acquires academic and theoretical Techniques which qualify him to practice the practical life of his field in terms of the Raw materials technology used in his work and the methods of calculations , the cost or knowledge in the physical feature , in addition to the Engineering Drawing and the final shape of the product before fabrication .

C- Skills acquired from the Practical Curricula :

1- Ability to fabricate furniture pieces which correspond with the modern development.

2- Final knowledge In the use of paints

3- Full knowledge in the modern technology of the Product

4- Ability to use manual tools and modern industrial machines.

5- Compliance with safety and security rules while using the manual tools and machines.

B) Skills gained from practical training curriculum:

1) Ability to create furniture suitable to the time.
2) Sense of selecting the suitable paint.
3) Ability to use new techniques for production.
4) Ability to use manual tools and new industrial devices.
5) Follow safety rules when dealing with machines and tools.

C) Knowledge gained through theoretical curriculum:

I . Theoretical Technique:

Theoretical technique will help the trainee to know:

1) The basic and technological styles related to the carpentry works.
2) The diagrams according to the national standards.
3) About the latest materials that are used in the carpentry field.

II . Applied Mathematics:

Study of the Applied Mathematics will provide the trainee knowledge of:

1) Technical calculations related to the job containing symbols and units.

2) Motor functions for knowing various levels of speed for cutting the wood.

3) Initial and final cost of product before and after manufacturing.

4) Reading diagrams.

5) Humidity, moisture and contraction of wood as a material during storing it.

III . Geometric Drawing:

Study of the Geometric Drawing will help the trainee to learn:

1) About the technical terms and symbols used in furniture pieces diagram.

2) About the rules and mode of dimensions and measurements.

3) About the basic rules for the final geometric drawing of the product.

Fifth : GENERAL SUBJECTS DIVISION

Of the Industrial institute

- **Fourth Year Specialization**

Brief on the General Subject Division Of The Industrial Institute - Sabah Alsalem :

The section of the general subject in the Industrial institute-Sabah AL-Salem is one of the major effective sections which performs vital role , as it is the only Division which interacts with all the other specified sections . Through the general materials in the section , the graduation requirements of the Industrial institute Trainee shall be completed . the materials taught by the Instructors are :

-Islamic Education : Includes Quran verses , Prophet Hadith, general ethics and Prophet Life .

-Arabic language : Includes literature texts , Grammar , linguistic skills and use of language Dictionaries.

-values and loyalty : Aims to develop the loyalty to the religion , self values and loyalty to the home Country and work.

-P.E : includes sport exercises , skill development , Physical Fitness and recreation .

-Industrial Admin : aims to provide knowledge in small projects , and the strong and weak points in such projects , feasibility studies , execution , Industrial Security , Quality and ISO System .

-Math's : Includes triangles arithmetic , principles in maths, Algebra Forms , account analysis and derivatives.

-Chemistry : includes branches , symbols , Formula, chemistry accounts , oxidation , organic chemistry , acids , electric chemistry , electrode cells .

-Physics: includes the Physical measurements , balance of forces , objects stability , kinetic energy .

The section organizes from time to time religious , language and sport Competitions to provide the knowledge and recreation to the Trainees and staff.

Held in the industrial Institute (Sabah ALSalem)

Diploma Certificate Prog. (2nd Technician) (6 Training Semesters)						
Symbol specifications		Subject symbol	Symbol of Training Semester	Graduate Level	Section symbol	institute symbol
No of fields for each item		××	×	-×-	××	××
General subjects	Arabic language	01	×	-3-	01	17
	Islamic Education	02	×	-3-	01	17
	Work values	03	×	-3-	01	17
	P.E	04	×	-3-	01	17
	Physical training	05	×	-3-	01	17
Electricity Section	Electrical Connections	1×	×	-3-	02	17
	Cooling &AC	2×	×	-3-	02	17
	Electric power	3×	×	-3-	02	17
Electronics Section	Radio & TV	1×	×	-3-	06	17
	Measurement & Control	2×	×	-3-	06	17
Cars section	Gasoline	1×	×	-3-	03	17
	Diesel	2×	×	-3-	03	17
	Cars Electricity	3×	×	-3-	03	17
	Body shop	4×	×	-3-	03	17
Mechanical section	General mechanic	1×	×	-3-	04	17
	Welding mechanic	2×	×	-3-	04	17
	Operation mechanic	3×	×	-3-	04	17
Construction section	Carpentry& decoration	1×	×	-3-	04	17
Subjects of all sections	Technology	×1				
	Math's	×2				
	Eng. Drawing	×3				
	Practical training	×5				
	computer	06	×	-3-	06	17
Field training	First	×1	0	-3-	×	17
	Second	×2	0	-3-	×	17

Training Subjects of industrial Institute (Sabah ALSalem)

Diploma Certificate Prog. (Post secondary) (4 Training Semesters) Vehicles Inspector Program (Cars sectioned)						
Symbol specifications		Subject symbol	Symbol of Training Semester	Graduate Level	Section symbol	institute symbol
No of fields for each item		××	×	-×-	××	××
General subjects	English language	13	×	-1-	01	17
	Chemistry	60	×	-1-	01	17
Computer	Computer	16	×	-1-	06	17
Specialty subjects	Eng. Drawing	53	×	-1-	03	17
	Workshop Tech.	55	×	-1-	03	17
	Traffic law	54	×	-1-	03	17
	Cars Technology	56	×	-1-	03	17
	Applied mechanics	51	1	-1-	03	17
	Math's	52	1	-1-	03	17
	thermodynamics	51	2	-1-	03	17
	Principles of electricity	52	2	-1-	03	17
	Public relations	57	2	-1-	03	17
	Hydraulic Principles	51	3	-1-	03	17
	Fuels & oils	57	3	-1-	03	17
	Maintenance basics	58	3	-1-	03	17
	Cars Electricity	52	3	-1-	03	17
	Technical service	59	3	-1-	03	17
	Methods of vehicles Testing	51	4	-1-	03	17
	Standard Gulf Spec.	52	4	-1-	03	17
	Environment Pollution	57	4	-1-	03	17
	Safety &Security	58	4	-1-	03	17
	Technical Reports	59	4	-1-	03	17
Field Training		11	0	-1-	03	17