



BANGLADESH TECHNICAL EDUCATION BOARD
Agargoan, Dhaka-1207.

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM
SYLLABUS (PROBIDHAN-2016)

ELECTRONICS TECHNOLOGY
TECHNOLOGY CODE: **668**

3rd SEMESTER

DIPLOMA IN ENGINEERING
PROBIDHAN-2016

ELECTRONICS TECHNOLOGY (668)

3rd SEMESTER

Sl. No	Subject Code	Name of the subject	T	P	C	Marks				Total
						Theory		Practical		
						Cont. assess	Final exam	Cont. assess	Final exam	
1	66831	Advanced Electronic Devices and Circuits	3	3	4	60	90	25	25	200
2	66832	PCB Design and Prototyping	0	6	2	0	0	50	50	100
3	66833	Electronic Appliances	2	3	3	40	60	25	25	150
4	66835	Basic Communication Engineering	2	3	3	40	60	25	25	150
5	65922	Physics -2	3	3	4	60	90	25	25	200
6	65931	Mathematics -3	3	3	4	60	90	50	0	200
7	65722	Communicative English	1	3	2	20	30	50	0	100
Total			14	24	22	280	420	250	150	1100

AIMS

- To provide knowledge and skills on UJT, SCR POWER MOSFET and TRIAC.
- To provide knowledge and skills on controlled rectifier.
- To provide knowledge and skills on wave shaping circuits.
- To familiarize with integrated circuits.
- To provide knowledge on the Operational Amplifier.
- To familiarize with integrated circuit voltage regulator

SHORT DESCRIPTION

UJT, SCR, PUT, MOSFET, DIAC, TRIAC, controlled rectifier, wave shaping circuits, integrated circuit, Operational amplifier, transconductance & Norton operational amplifier, Timer ICs, Integrated circuit voltage regulator.

DETAIL DESCRIPTION

Theory:

1. Understand the Concept of Unijunction Transistor (UJT).
 - 1.1 Describe the structure and operation of UJT.
 - 1.2 Identify the UJT by its equivalent circuit.
 - 1.3 Define stand off ratio.
 - 1.4 Explain why UJT is not a thyristor.
 - 1.5 Analyze the operation of a UJT relaxation oscillator.

2. Understand the Concept of Silicon Control Rectifier (SCR)
 - 2.1 Define Thyristors.
 - 2.2 Mention the types of Thyristors.
 - 2.3 Describe the construction and operation of SCR.
 - 2.4 Describe the V-I characteristics of SCR.
 - 2.5 Explain the operation of SCR using two-transistor Equivalent circuit.
 - 2.6 Derive the equation for anode current.
 - 2.7 Explain how to turn an SCR on and off.
 - 2.8 Explain the operation of automatic battery charger, emergency lighting circuit, heater control, and over voltage protection circuits.
 - 2.9 Describe the construction and operation of light activated SCR (LASCR).

3. Understand the Concept of Controlled Rectifier.
 - 3.1 Define Controlled Rectifier.
 - 3.2 Mention the types of control rectifier.
 - 3.3 Describe the operation of half wave controlled rectifier using SCR for resistive and inductive load with wave shapes.
 - 3.4 Analyze the operation of single-phase full-wave mid-point controlled rectifier, Half controlled and full controlled bridge rectifier with wave shapes.
 - 3.5 Explain the effect of freewheeling diode in rectifier circuit with inductive load.

- 3.6 Describe the operation of poly-phase controlled rectifier.
 - 3.7 Mention the operation of (a) Illumination circuit (b) Speed control of dc and ac motors.
4. Understand the Concept of Programmable Unijunction Transistor (PUT)
- 4.1 Describe the structure and operation of the PUT.
 - 4.2 State how to set the trigger voltage of PUT.
 - 4.3 Explain the difference between a PUT and UJT.
 - 4.4 Analyze the operation of a PUT relaxation oscillator.
 - 4.5 Define power MOSFET.
 - 4.6 Describe the construction and operation of high power MOSFET.
 - 4.7 Describe the operation of Gate drive circuit for power MOSFET.
5. Understand the Concept of DIAC and TRIAC
- 5.1 Describe the structure and operation of DIAC.
 - 5.2 Explain the V-I characteristics curve of DIAC.
 - 5.3 Describe the structure of TRIAC.
 - 5.4 Discuss the SCR equivalent circuit of TRIAC.
 - 5.5 Explain the triggering modes of TRIAC.
 - 5.6 Describe the characteristics curve of TRIAC.
 - 5.7 State the commutation of TRIAC.
 - 5.8 Analyze the operation of TRIAC firing circuits .
 - 5.9 Analyze the operation of a TRIAC phase control, lamp dimmer and Heat control circuit.
6. Understand the features of wave shaping circuits.
- 6.1 Mention the types of wave shaping circuit.
 - 6.2 Discuss the principles of RC and RL differentiating and integrating circuits.
 - 6.3 Analyze the output waves for various input wave shapes of differentiating and integrating circuit.
 - 6.4 Explain the operation of various clippers by PN junction diode, zener diode and transistor.
 - 6.5 Describe the operation of diode clamping circuit for different input wave shape.
7. Understand the Features of Integrated Circuit (IC).
- 7.1 Define IC
 - 7.2 List the advantages and limitation of IC's.
 - 7.3 Mention the scale of integration.
 - 7.4 Identify the types of integrated circuits.
 - 7.5 Describe the fabrication monolithic integrated circuits.
 - 7.6 Describe the fabrication of integrated circuit components resistor, capacitor Transistor.
8. Understand the Features of Operational Amplifier (Op- Amp)
- 8.1 Define operational amplifier.
 - 8.2 Recognize the Op-Amp symbol.
 - 8.3 State the basic principle of Op-Amp.
 - 8.4 State the golden rule and virtual ground of Op-Amp.
 - 8.5 List the characteristics of an ideal Op-Amp.
 - 8.6 State the input& output impedance, offset voltage, input bias current, offset current, common-mode input voltage range, open-loop voltage gain, common-mode rejection ratio, slew rate, frequency response and unity-gain bandwidth.

- 8.7 Explain the operation of Op-Amp in inverter, unity follower, comparator, adder, subtractor, differentiator, integrator,
- 9. Understand the 555 and 741 IC
 - 9.1 Describe the pin out diagram of 741 IC
 - 9.2 Applications of 741 IC as inverter, adder, subtractor and comparator.
 - 9.3 Define electronic Timer.
 - 9.4 Describe the Function of internal blocks of timer IC 555.
 - 9.5 Explain the use of 555 timers in monostable and astable mode.
- 10. Understand the Features of Integrated Circuit Voltage Regulators.
 - 10.1 Define voltage regulator.
 - 10.2 Discuss line and load regulation.
 - 10.3 Identify the block representation of three-terminal voltage regulator.
 - 10.4 Describe the 78xx series of fixed positive voltage regulators.
 - 10.5 Describe the 79xx series of fixed negative voltage regulators.
 - 10.6 Describe the LM317 adjustable positive regulator.
 - 10.7 Describe the LM 337 adjustable negative regulator.
 - 10.8 Mention the voltage-regulator specifications.

Practical:

- 1. Determine the characteristics curve of UJT.
 - 1.1 Select an appropriate experiment circuit, required materials, tools and equipments.
 - 1.2 Connect the circuit as per diagram with meters.
 - 1.3 Check the circuit and switch on the power supply.
 - 1.4 Record the data for I-V curve.
 - 1.5 Plot the curve.
- 2. Study the gate control of forward breakdown voltage for an SCR.
 - 2.1 Select an appropriate circuit, required tools, equipments and materials.
 - 2.2 Connect the circuit as per diagram with meters.
 - 2.3 Switch on the power supply and make proper adjustments.
 - 2.4 Set the gate control at minimum and observe the breakdown voltage for V-I characteristics.
 - 2.5 Increase gate current in steps and observe the breakdown voltage.
 - 2.6 Plot the I-V characteristics curve.
 - 2.7 Compare different curves and breakdown voltage.
- 3. Study the Operation of a single phase controlled rectifier using SCR.
 - 3.1 Select an appropriate experiment circuit.
 - 3.2 Select required tools, equipments and materials.
 - 3.3 Connect the circuit as per diagram with Oscilloscope.
 - 3.4 Check the connection and switch on the power supply.
 - 3.5 Observe the wave shapes at relevant points of the circuit.
- 4. Study the Operation of a Illumination Circuit.
 - 4.1 Select an appropriate experiment circuit.
 - 4.2 Select required tools, equipments and materials.
 - 4.3 Connect the circuit as per diagram.
 - 4.4 Check the connection and switch on the power supply.
 - 4.5 Adjust the POT and observe the Illumination.

5. Determine the characteristics curve of DIAC.
 - 5.1 Select an appropriate experiment circuit, required materials, tools and equipments.
 - 5.2 Connect the circuit as per diagram with meters.
 - 5.3 Check the circuit and switch on the power supply.
 - 5.4 Record the data for I-V curve.
 - 5.5 Plot the curve.

6. Study the Operation of a RC differentiating circuit.
 - 6.1 Select a RC differentiating circuit.
 - 6.2 Select required materials, tools and equipments.
 - 6.3 Connect the circuit as per diagram with CRO.
 - 6.4 Switch on the power supply.
 - 6.5 Adjust the signal frequency for the differentiating circuit.
 - 6.6 Observe the output wave for different input wave shape on CRO screen.

7. Study the Operation of a RC Integrating circuit.
 - 7.1 Select a RC differentiating circuit.
 - 7.2 Select required materials, tools and equipments.
 - 7.3 Connect the circuit as per diagram with CRO.
 - 7.4 Switch on the power supply.
 - 7.5 Adjust the signal frequency for the differentiating circuit.
 - 7.6 Observe the output wave for different input wave shape on CRO screen.

8. Study the operation of biased and unbiased series and shunt clipping circuits for positive and negative peak and bias clipping of a sine wave using switching diodes.
 - 8.1 Select a required circuit.
 - 8.2 Select the associate equipments and materials.
 - 8.3 Buildup the circuit for required wave shapes.
 - 8.4 Switch on the power supply.
 - 8.5 Observe the output on CRO screen.

9. Study the operation a clamping circuit.
 - 9.1 Select a required circuit.
 - 9.2 Select the associate equipments and materials.
 - 9.3 Buildup the circuit for required wave shapes.
 - 9.4 Switch on the power supply.
 - 9.5 Observe the output on CRO screen.

10. Study the operation of Op-Amp (for IC 741) as inverting and non inverting amplifier, adder, comparator, buffer and subtractor.
 - 10.1 Select a required circuit.
 - 10.2 Select the associate equipments and materials.
 - 10.3 Buildup the circuit as per function.
 - 10.4 Switch on the power supply.
 - 10.5 Observe the input and output wave shape on CRO screen.

11. Study the Operation of fixed voltage regulator circuit using 78xx series IC.
 - 11.1 Select required circuit.
 - 11.2 Select required equipments and materials.
 - 11.3 Buildup the circuit.
 - 11.4 Switch on the power supply.
 - 11.5 Observe the output voltage for varying input voltage and load current.

12. Study the Operation of fixed voltage regulator circuit using 79xx series IC.
 - 12.1 Select required circuit.
 - 12.2 Select required equipments and materials.
 - 12.3 Buildup the circuit.
 - 12.4 Switch on the power supply.
 - 12.5 Observe the output voltage for varying input voltage and load current.

13. Study the characteristics of IC555 timer connected as :
 - a) astable multivibrator and b) monostable multivibrator.
 - 13.1 Select required circuit.
 - 13.2 Select required equipments and materials.
 - 13.3 Buildup the circuit.
 - 13.4 Switch on the power supply.
 - 13.5 Observe the output waveform on CRO screen..

REFERENCES:

1. A Text Book of Applied Electronics
 - R. S. Sedha

2. Electronic Devices
 - Floyd

3. Power Electronics
 - Dr. P.S. Bimbhra

4. Principles of Electronics
 - V. K. Metha

5. Electronic Device and Circuit Theory
 - Robert L. Boylestad, Louis Nashelsky

6. Easy Electronic Project
 - Delton T Horn

7. Electronic Device & Circuits
 - Millman Halkies, Tata McGraw Hill-2nd edition-2007

AIMS

- To assist to acquire the skills needed for drawing & designing by CAD package.
- To provide the skill needed for PCB design and schematic drawing by typical package.
- To provide the skill needed for making PCB designed by CAD.
- To provide the skill needed for Build up simple project.

SHORT DESCRIPTION

Setting up drawing environments and aids; Drawing and editing schematic circuits; Analyzing a schematic Circuit; Organizing the drawing information on layers; Exporting PCB Net list; Creating a simple PCB layout; editing the PCB layout; Printing, plotting PCB layout and making PCB Build up simple project.

DETAIL DESCRIPTION

- 1. Set up the drawing environment and drawing aids.**
 - 1.1. Start an Suitable Simulation Software. (Such as Express PCB, Proteus, Electronic Work Bench, Circuit maker etc.)
 - 1.2. Identify the menu bar, toolbar, drawing area and special windows for circuit simulation and testing purpose.
 - 1.3. Familiarize with tools, toolkits and buttons (such as arrow, wire, text, Deleted)
 - 1.4. Familiarize with workspace, conventions, preferences, shortcuts and hotkeys.
 - 1.5. Place components such as resistors, transistors, power supply etc.
 - 1.6. Save the drawing environment.
 - 1.7. Exit from the simulation software package.
- 2. Draw schematic Circuit.**
 - 2.1 Select an electronic Circuit diagram.
 - 2.2 Place Devices according to circuit diagram (such as resistors, transistors, IC, power supply, grounds etc) in the workspace Selected CAD package.
 - 2.3 Wire devices together.
 - 2.4 Edit devices with values and parameters.
- 3. Analyze a schematic Circuit.**
 - 3.1 Add device meter to circuit diagram and set device meter values.
 - 3.2 Simulate the circuit.
 - 3.3 View Circuit voltage and current or digital logic level.
 - 3.4 Change a device value and quickly analyze the circuit.
 - 3.5 Perform DC and AC analysis of the circuit using circuit analyzer/oscilloscope.
- 4. Organize the drawing information on layers.**
 - 4.1. Identify the layer control options.
 - 4.2. Create and name the layers.
 - 4.3. Make the layer current and control layer visibility.
 - 4.4. Freeze, lock and unlock the layers.
 - 4.5. Set the layer color & line type.
- 5. Export PCB Net list.**
 - 5.1. Familiarize PCB Net list requirement.
 - 5.2. Create a PCB Net list file.
 - 5.3. Export the PCB Net list file in appropriate format.
 - 5.4. Run appropriate PCB layout and auto routing Program.
 - 5.5. Load PCB Net list file.
 - 5.6. Define the board size.
 - 5.7. Use auto placement feature for placing Net list component on the board.

- 6. Create a simple PCB layout.**
 - 6.1 Select the schematic diagram comprising of resistors, capacitors, transistors, op-amps, logic gates, etc.
 - 6.2 Run any professional PCB layout packages.
 - 6.3 Load the layout drawing (symbols, pads, lines, components, etc.) from the components library.
 - 6.4 Configure the system for units and co-ordinates.
 - 6.5 Use commands to display the grids.
 - 6.6 Zoom and un zoom the drawing area.
 - 6.7 Connect the pads with tracks to make the schematic circuit diagram.
 - 6.8 Save & exit the layout.
- 7. Edit the PCB layout.**
 - 7.1 Load or open the PCB layout.
 - 7.2 Delete & insert the nodes, track and layout entities.
 - 7.3 Change the size and shape of pad, track and symbols.
 - 7.4 Duplicate and rearrange the layout entities (use copy, move & rotate commands).
 - 7.5 Change the width of the tracks.
 - 7.6 Set up & use layouts and colors.
 - 7.7 Include the text in the layout.
 - 7.8 Save the PCB layout.
- 8. Print and plot the PCB layout.**
 - 8.1 Open the PCB layout.
 - 8.2 Select the output format.
 - 8.3 Set up the printing options.
 - 8.4 Set up the area of plot size.
 - 8.5 Compensate for printer or plotter in accuracy.
 - 8.6 Print on tracing paper PCB layout.
- 9. Make the photo resist coating emulsion.**
 - 9.1 Select the required materials such as sona code and dichromate.
 - 9.2 Prepare photo coating emulsion.
- 10. Make the PCB using screen printing techniques.**
 - 10.1 Select the required frame with silkscreen.
 - 10.2 Take printed tracing paper PCB layout.
 - 10.3 Prepare the screen by proper steps for PCB printing.
 - 10.4 Prepare the PCB by proper steps.
- 11. Build the project.**
 - 11.1 Insert the components on the PCB.
 - 11.2 Solder the components.
 - 11.3 Test/Examine the circuit for Prototype proper operation.

NB: Students can select projects from the following list.

- i) Regulated power supply.
- ii) Timers using 555 and other oscillators.
- iii) Clapping switch and IR switch.
- iv) Blinkers.
- v) Sirens and hooters.
- vi) Single band AM or FM Radio receiver.
- vii) Cell charger, battery charger, mobile charger.
- viii) Fire or smoke alarm.
- ix) Liquid level controller.
- x) Counters.
- xi) Combination locks.
- xii) Electronic musical instruments.
- xiii) Audio amplifiers.
- xiv) Automotive stabilizer/CVT.
- xv) Emergency light.
- xvi) Fan regulator.

AIMS

- To develop understanding and skill on the construction and operation of electronics-appliances..
- To acquire skill in diagnosing or localizing faults and repairing & servicing of electronics appliances.

SHORT DESCRIPTION

Public Addressing system, Home security & Surveillance, Microwave oven, induction cooker, Industrial Electronics Appliance, Health Electronics Appliance, Energy Savings (LED) Lamp, Vacuum Cleaner, Washing machine, Refrigerator & Air conditioner, Lift, Office Electronic Appliance.

DETAIL DESCRIPTION**Theory :**

- 1 Understand the basic features of electronic appliances.**
 - 1.1 State the meaning of electronic appliances.
 - 1.2 State the nature of electronic appliance.
 - 1.3 List the names of electronic appliances.
 - 1.4 State the importance of electronic appliances.

- 2 Understand the Public Addressing system.**
 - 2.1 State public addressing system.
 - 2.2 Classify Public Addressing system.
 - 2.3 Identify different units of Public Addressing system.
 - 2.4 Sketch the Functional Block diagram of Public Addressing system.
 - 2.5 List the possible faults, causes and remedies of Public Addressing system.

- 3 Understand the Home security & Surveillance.**
 - 3.1 List different types of Home security & Surveillance.
 - 3.2 Describe the Home security system with Remote monitoring.
 - 3.3 Draw the connection diagram of CC camera, monitor and DVR.
 - 3.4 List the possible faults, causes and remedies of Home security system

- 4 Understand the working principle of microwave oven.**
 - 4.1 State the basic principle of microwave oven.
 - 4.2 List the main parts of a microwave oven.
 - 4.3 Sketch the block diagram of a microwave oven.
 - 4.4 Describe the operation of a microwave oven.
 - 4.5 Describe the function of heat control and timer of microwave oven.
 - 4.6 List the possible faults, causes and remedies of microwave oven.

- 5 Understand the working principle of induction cooker.**
- 5.1 Define induction cooker.
 - 5.2 List the main parts of a induction cooker.
 - 5.3 Describe the function of a induction cooker
 - 5.4 List the possible faults, causes and remedies of induction cooker.
- 6 Understand the features of Industrial Electronics Appliance.**
- 6.1 List different types of Industrial Appliance.
 - 6.2 State the function of sound meter, Digital balance meter & Servo system.
 - 6.3 State the principle of operation of Servo system.
 - 6.4 List the possible faults, causes and remedies of above appliance.
- 7 Understand the features of Health Electronics Appliance.**
- 7.1 List different types of Health Appliance.
 - 7.2 State the principle of operation of control Treadmill.
 - 7.3 State the principle of operation of Digital Blood pressure meter.
 - 7.4 State the principle of operation of diabetic tester.
 - 7.5 List the possible faults and their causes and remedies of above appliances.
- 8 Understand the features of Energy Savings(LED)Lamp.**
- 8.1 Define energy savings lamp.
 - 8.2 State the different between LED and others energy saving lamps.
 - 8.3 State the working principle of energy savings lamp.
 - 8.4 List the possible faults, causes and remedies of energy savings lamp.
- 9 Understand the features of a Vacuum Cleaner.**
- 9.1 Name the different parts of a vacuum cleaner.
 - 9.2 State the working principle of a vacuum cleaner.
 - 9.3 List the possible faults, causes and remedies of vacuum cleaner.
- 10 Understand the features of a Washing machine.**
- 10.1 List the different parts of a washing machine.
 - 10.2 State the principle of operation of a washing machine.
 - 10.3 Explain complete washing cycle of a washing machine.
 - 10.4 List the possible faults, causes and remedies of washing machine.
- 11 Understand the features of a Refrigerator & Air conditioner.**
- 11.1 State the operating principle of a refrigerator.
 - 11.2 Sketch the refrigeration cycle.
 - 11.3 State the operating principle of air conditioner.
 - 11.4 List the possible faults, causes and remedies of refrigerator & air conditioner.
- 12 Understand the features of Office Electronic Appliance.**
- 12.1 State the principle of operation of Photocopier machine.
 - 12.2 State the working principle of Printer.
 - 12.3 List the control unit of Scanner.
 - 12.4 Define Card reader.
 - 12.5 State the working principle of Card reader.
 - 12.6 List the possible faults, causes and remedies of above appliances.

Practical :

- 1 Perform maintenance and servicing of Public Addressing system.**
 - 1.1 Disassemble the Public Addressing system.
 - 1.2 Identify the different section of Public Addressing system.
 - 1.3 Show the fault finding procedure of Public Addressing system.
 - 1.4 List possible troubles with causes and remedies of Public Addressing system.
 - 1.5 Assemble the Public Addressing system and observe the operation.

- 2 Perform maintenance and servicing of Home security & Surveillance.**
 - 2.1 Show the Skill of installing of Home security & Surveillance
 - 2.2 Identify the different unit of Home security & Surveillance.
 - 2.3 Show the fault finding procedure of Home security & Surveillance.

- 3 Perform maintenance and servicing of Microwave oven.**
 - 3.1 Disassemble the microwave oven.
 - 3.2 Identify the parts of microwave oven.
 - 3.3 Show the fault finding procedure of microwave oven.
 - 3.4 List possible troubles with causes and remedies of a microwave oven.
 - 3.5 Assemble the parts and connect the oven to the power source.
 - 3.6 Observe the operation.

- 4 Perform maintenance and servicing of induction cooker.**
 - 4.1 Disassemble the induction cooker.
 - 4.2 Identify the different parts of induction cooker.
 - 4.3 Show the fault finding procedure of induction cooker.
 - 4.4 List possible troubles with causes and remedies of induction cooker.
 - 4.5 Assemble the induction cooker and observe the operation.

- 5 Perform repair and maintenance of Digital balance meter.**
 - 5.1 Disassemble the Digital balance meter.
 - 5.2 Show the fault finding procedure of Digital balance meter.
 - 5.3 List possible troubles with causes and remedies of Digital balance meter.
 - 5.4 Assemble the Digital balance meter and observe the operation.

- 6 Perform repair and maintenance of Servo system.**
 - 6.1 Disassemble the Servo system.
 - 6.2 Show the fault finding procedure of Servo system.
 - 6.3 List possible troubles with causes and remedies of Servo system.
 - 6.4 Assemble the Servo system and observe the operation.

- 7 Perform the operation and maintenance of Diabetic tester.**
 - 7.1 Perform the operation of Diabetic tester
 - 7.2 Show the fault finding procedure of Diabetic tester.
 - 7.3 List possible troubles with causes and remedies of Diabetic tester.

- 8 Perform the operation of control Treadmill**
 - 8.1 Perform the operation of control Treadmill.
 - 8.2 Find out the electronic control sections of control Treadmill.
 - 8.3 List possible troubles with causes and remedies of control Treadmill.

- 9 Perform repair and maintenance of Energy Savings (LED) Lamp.**
- 9.1 Disassemble the Energy Savings Lamp.
 - 9.2 Test the battery of the lamp.
 - 9.3 Check the parts of Energy Savings Lamp.
 - 9.4 Repair and replace the defective parts, if any.
 - 9.5 Reassemble the lamp and connect to the power source.
 - 9.6 Observe the charging and discharging condition.
- 10 Perform repair and maintenance of a vacuum cleaner.**
- 10.1 Disassemble the parts of the vacuum cleaner.
 - 10.2 Check the parts to ensure the sound condition.
 - 10.3 Repair or replace the defective parts, if any.
 - 10.4 Reassemble the parts.
 - 10.5 Connect the appliances to the power source.
 - 10.6 Observe the operation.
- 11 Perform repair and maintenance of a washing machine.**
- 11.1 Identify the main parts of the washing machine.
 - 11.2 Disassemble the major components.
 - 11.3 Make a visual observation.
 - 11.4 Reassemble the parts.
 - 11.5 Connect the washing machine to the power supply.
 - 11.6 Observe the operation.
- 12 Perform repair and maintenance of a refrigerator.**
- 12.1 Identify the different parts of refrigerator.
 - 12.2 Identify the Electronic sections of refrigerator.
 - 12.3 Note down the maintenance procedure of a refrigerator.
 - 12.4 Disassemble and assemble the thermostat control, timer & relay.
 - 12.5 Connect the power source.
 - 12.6 Observe the operation.
- 13 Perform repair and maintenance of components of air-conditioner.**
- 13.1 List the main parts of the air-conditioner.
 - 13.2 Sketch the wiring diagram.
 - 13.3 Disassemble and assemble the components of the air conditioner.
 - 13.4 Connect the air conditioner to the power supply.
 - 13.5 Observe the operation.
- 14 Perform operation and maintenance of a lift.**
- 14.1 Visit a nearby establishment where a lift is available.
 - 14.2 Note down the different specifications of the lift.
 - 14.3 Observe the operating principle of the lift.
 - 14.4 Sketch different components of the lift.
 - 14.5 Identify the possible troubles and their remedies.
- 15 Perform repair and maintenance of a Treadmill.**
- 15.1 Identify the different parts of a Treadmill.
 - 15.2 Identify the Electronic sections of a Treadmill.
 - 15.3 Note down the maintenance procedure of a Treadmill.
 - 15.4 Disassemble and assemble the a Treadmill.

16 Perform repair and maintenance of a Printer.

- 16.1 State the principle of operation of Printer.
- 16.2 Identify the different parts of Printer.
- 16.3 List the electronic control unit of Printer.
- 16.4 Note down the maintenance procedure of Printer.
- 16.5 Disassemble and assemble the a Printer.

REFERENCE BOOK

- 1. Home appliances Service Guide – Edwin P. Anderson.
- 2. Study of electrical appliances and devices - K.B Bhatia
- 3. Electrical home appliances service manual - S. K . Gupta, Gt publication
- 4. Microcontroller based home security system
With remote monitoring - Nikhil Agawal
- 5. Life Span I Fit --- TR7000I/TR8000

AIMS

To acquire knowledge, skill and attitude in the area of Basic Communication engineering with special emphasis on :

- Basic communication and its historical background
- Signals and systems
- Modulation and demodulation
- Radio transmitter and radio receiver,
- Telephone system,
- Transmission media,
- Digital data transmission,

SHORT DESCRIPTION

Concept of basic communication system, Signals and Noise, Modulation/Demodulation, Radio transmitter and receiver, Telephone system, Transmission media, Digital communication, Data transmission,

DETAIL DESCRIPTIONTheory :

1. Understand the concept of basic communication and its historical background

- 1.1 Define communication & telecommunication.
- 1.2 Describe the historical development of telecommunication
- 1.3 Mention the different types of communication
- 1.4 Describe the basic block diagram of communication system.
- 1.5 Describe the function of BTRC
- 1.6 Describe the IEEE-802 project group.
- 1.7 Describe the organization and functions of the ITU.
- 1.8 Mention the role of OSS, ECMA, EIA and COS organization.

2 **Understand the signals and Noise in telecommunication system.**

- 2.1 Define Signal and noise.
- 2.2 Explain the nature of different signals and their frequency ranges.
- 2.3 Mention the different types and sources of noise
- 2.4 Define Signal-to-Noise ratio.
- 2.5 Describe the basic block of communication system.
- 2.6 Describe the noise figure.
- 2.7 Define baud.
- 2.8 Describe bandwidth and information capacity.
- 2.9 Describe the factors affecting the channel capacity.

3 Understand Amplitude modulation

- 3.1 Define modulation.
- 3.2 Mention the necessity of modulation.
- 3.3 Define Amplitude modulation.
- 3.4 Describe the basics of AM modulation.
- 3.5 Derive the expression of AM modulation.
- 3.6 Define modulation index and depth of modulation.
- 3.7 Describe the idea of DSB-SC, SSB-SC and VSB modulation.

4 Understand the frequency and pulse modulation

- 4.1 Define frequency modulation.
- 4.2 Describe the concept of frequency modulation
- 4.3 Derive the expression for frequency modulated wave.
- 4.4 Explain the FM spectra and bandwidth.
- 4.5 Describe the idea of modulation index, maximum frequency deviation and deviation ratio of FM .wave
- 4.6 State the method of generation of PPM, PDM and PWM signals
- 4.7 Describe the comparison of AM , FM and PM

5 Understand the feature of AM and FM modulator

- 5.1 Explain the basic operation of collector modulator, base modulator and balanced modulator.
- 5.2 Describe the principle of SSB-SC generation
- 5.3 Mention the principles of operation of varactor diode modulator.
- 5.4 Mention the application of various modulator.

6 Understand the demodulation of AM waves

- 6.1 Explain the principle of operation of linear diode detector.
- 6.2 State the concept of Envelope detector
- 6.3 Understand the synchronous detector
- 6.4 Explain the basic principle of PLL with block diagram.

7 Understand the demodulation of FM wave

- 7.1 Explain the basic principle of detection of FM wave.
- 7.2 List the methods of FM demodulation.
- 7.3 Explain ratio detector and its advantages
- 7.4 State the function of limiter circuit

8 Understand the Radio Transmitter

- 8.1 State the classification of radio transmitters in terms of power, frequency, modulation, service involved
- 8.2 Explain the block diagram of AM transmitter with function of each state.
- 8.3 State the difference between high level and low level modulation.
- 8.4 Explain the block diagram of stereo FM transmitter with resulting spectrum.
- 8.5 Explain the operation of SSB-SC transmitter with block diagram.

9 Understand the radio receiver

- 9.1 Describe briefly the operation of crystal, Tuned radio-frequency receiver and super receiver.
- 9.2 Explain the block diagram of super heterodyne AM radio receiver with function of each block and waveforms at input and output of each block.
- 9.3 Explain the typical circuit of each block of super heterodyne receiver.
- 9.4 Explain a typical IC based AM and FM radio receiver circuit
- 9.5 Explain choice, alignment and tracking, IF and band switch of a radio receiver.
- 9.6 Explain the sensitivity, selectivity and fidelity.

10 Understand the feature of Telephone

- 10.1 Describe briefly telegraphy and telephony system
- 10.2 Describe the working principle of telephone handset transmitter and receiver.
- 10.3 Define side tone.
- 10.4 Mention advantage and disadvantage of side tone.
- 10.5 Describe the tones used in automatic telephone.
- 10.6 Describe different type of dialing system .
- 10.7 Define the terms traffic, busy hour traffic unit, grade of service, availability and erlong's formula.

11. Understand the concept of digital communication

- 11.1 Define of digital communication.
- 11.2 Mention the advantage of digital communication.
- 11.3 Describe the sampling theorem
- 11.4 Mention the types of sampling.
- 11.5 Describe the quantization & coding principle of PNM & PCM
- 11.6 Describe the functional diagram of PNM & PCM.
- 11.7 Describe the quantization noise, fold-Over noise, Interpolation Noise & error for PCM.
- 11.8 Explain the methods of reducing quantization noise, fold-Over noise and Interpolation noise.

12 Understand the modulation of digital data

- 12.1 Understand the modulation of binary data
- 12.2 Describe ASK, FSK and PSK
- 12.3 List the application of ASK, FSK and PSK techniques in analogue and data Communication
- 13.4 Explain the methods of quadrature amplitude modulation (QAM).

13 Understand the transmission media

- 13.1 Mention the categories of transmission media.
- 13.2 Describe the construction of twisted pair (UTP,STP), coaxial and fiber optic cable.
- 13.3 State the characteristics of twisted pair (UTP,STP), coaxial and fiber optic cable.
- 13.4 State the application field of twisted pair (UTP,STP), coaxial and fiber optic cable.
- 13.5 Advantages and disadvantages of each types of cables.
- 13.6 Describe the method of radio, microwave and infra red communication system.

Practical :

- 1. Demonstrate the communication signals and spectra.**
 - 1.1 Select required equipment, tools and materials.
 - 1.2 Set up the equipment for observing audio frequency signal
 - 1.3 Observe amplitude, loudness, frequency, tone, wave, shape and sound quality.
 - 1.4 Observe low frequency sine waves/square waves/triangular waves at different frequencies and note sound quality.
 - 1.5 Note the relationship between bandwidth and sound quality.

- 2. Measure the modulation index for AM wave forms with different combination of modulating and carrier signals(at least four combination)**
 - 2.1 Select required circuit board , equipment, tools and materials.
 - 2.2 Connect the circuit and equipment.
 - 2.3 Input different modulating and carrier signals.
 - 2.4 Make proper adjustments.
 - 2.5 Record the required data.
 - 2.6 Calculate modulation index for each set of data.

- 3. Demonstrate the working of a DSB modulator with and without carrier suppression.**
 - 3.1 Select required circuit board , equipment, tools and materials.
 - 3.2 Setup the equipment for above conditions.
 - 3.3 Observe the operation.
 - 3.4 Observe the operation of carrier suppression on power efficiency

- 4. Demonstrate the working of Frequency modulation.**
 - 4.1 Select required circuit board , equipment, tools and materials.
 - 4.2 Set up circuit board and equipment.
 - 4.3 Input proper signals.
 - 4.4 Make proper adjustments.
 - 4.5 Observe FM wave.

- 5. Familiarize with the component layout and controls of popular radio receiver.**
 - 5.1 Select radio receiver, required equipment, tools and materials.
 - 5.2 Observe different components and their layout.
 - 5.3 Observe different control knobs.
 - 5.4 Observe adjustment of different control knobs and the service.

- 6. Demonstrate the RF amplifier and converter stage of AM radio receiver**
 - 6.1 Select radio receiver, required equipment, tools and materials.
 - 6.2 Identify the RF and converter stage in the circuit diagram and in the receiver.
 - 6.3 Make the list of the components.
 - 6.4 Trace the circuit in the receiver.

7. Demonstrate the IF and detector section of an AM radio receiver.

- 7.1 Select radio receiver, required equipment, tools and materials.
- 7.2 Identify the IF and converter stage in the circuit diagram and in the receiver.
- 7.3 Make the list of the components.
- 7.4 Trace the circuit in the receiver.

8. Demonstrate the audio stage of an AM radio receiver.

- 8.1 Select radio receiver, required equipment, tools and materials.
- 8.2 Identify the stage in the circuit diagram and in the receiver.
- 8.3 Make the list of the components.
- 8.4 Trace the circuit in the receiver.

9. Measure the DC and AC voltages at different points of a super heterodyne radio receiver.

- 9.1 Select radio receiver, required equipment, tools and materials.
- 9.2 Observe the circuit diagram and select the test points.
- 9.3 Measure the voltage at various points .
- 9.4 Prepare a voltage chart for observed voltage.
- 9.5 Compare the observed voltage with the given values in the diagram.

10. Demonstrate the process of alignment of AM radio receiver

- 10.1 Select AM radio receiver, required equipment, tools and materials.
- 10.2 Identify the components of alignment.
- 10.3 Process the alignment from output to input with half (middle) way setting.
- 10.4 Observe the tone.
- 10.5 Make realignment for better output.

11. Demonstrate the process of alignment of FM radio receiver

- 11.1 Select FM radio receiver, required equipment, tools and materials.
- 11.2 Identify the components of alignment.
- 11.3 Process the alignment from output to input with half (middle) way setting.
- 11.4 Observe the tone.
- 11.5 Make realignment for better output.

12. Demonstrate the operation of pulse code modulation

- 12.1 Select the circuit and required tools and materials.
- 12.2 Identify different parts and note its function.
- 12.3 Input pulse code (digital) signal.
- 12.4 Observe the analogue output.
- 12.5 Observe different process of operation.

13. Identify different types of guided communication media (UTP, STP, Co-axial, fiber optic cable) , types of connectors and accessories used with them and observe their constructional features.

References Books

1. **Communication Theory- Simon Haykin**
2. Electronic communication systems – Kenedy, Devis
3. Electronic communication - Dennis Roody, John Coolen
4. Digital Telephony – John Bellamy
5. Radio Engineering – G.K Mithal

OBJECTIVES

- To develop a foundation in scientific principles and processes for the understanding and application of technology.
- To develop an understanding of fundamental scientific concepts through investigation and experimentation.
- To provide a common base for further studies in technology and science.
- To develop the basic knowledge of modern physics.

SHORT DESCRIPTION

Thermometry and Heat Capacity; Expansion of materials (effect of heat); Heat transfer; Humidity; Nature of heat and Thermodynamics; Photometry; Reflection of light; Refraction of light; Electron , photon and Radio activity; Theory of Relativity.

DETAIL DESCRIPTION**THEORY****1. THERMOMETRY AND HEAT CAPACITY**

- 1.1 Define heat and temperature.
- 1.2 Mention the units of measurement of heat and temperature.
- 1.3 Distinguish between heat and temperature.
- 1.4 Identify the range of the Celsius scale determined by the boiling point and melting point of water
- 1.5 State the construction and graduation of a mercury thermometer.
- 1.6 Define specific heat capacity, thermal capacity and water equivalent with their units.
- 1.7 Prove the total heat gained by an object is equal to the sum of the heat lost by all the surrounding objects.
- 1.8 Explain the principle of calorimetry.
- 1.9 Define various kinds of specific latent heat.
- 1.10 Determine the latent heat of fusion of ice and latent heat of vaporization of water.
- 1.11 Determine the specific heat of a solid by calorimeter.

2. EFFECT OF HEAT ON DIMENSION OF MATERIALS

- 2.1 Show that different materials change in size at different amounts with the same heat source.
- 2.2 Explain the meaning of differential expansion in bimetallic strip, thermostats, compensated pendulum etc.
- 2.3 Explain the methods of overcoming problems caused by the expansion of materials in buildings, machinery, railway lines and bridges.
- 2.4 Mention the units co-efficient of linear, superficial and cubical expansion of solids.
- 2.5 Define the co-efficient of linear, superficial and cubical expansion of solids.
- 2.6 Relation between the co-efficient of linear, superficial and cubical expansion of solids.
- 2.7 Define real and apparent expansion of liquid.
- 2.8 Relation between the real and apparent expansion of liquid.

3. HEAT TRANSFER

- 3.1 Identify the phenomena of heat transferring from hot bodies to cold bodies.
- 3.2 Explain the methods of heat transfer by conduction, convection and radiation with examples of each type of transfer.
- 3.3 Define thermal conductivity (K) and Co-efficient of thermal conductivity.
- 3.4 Find the unit and dimension of Co-efficient of thermal conductivity.
- 3.5 List the factors which determine the quantity of heat (Q) flowing through a material.

- 3.6 Show that the quantity of heat flowing through a material can be found from

$$Q = \frac{KA (\theta_H - \theta_C)t}{d}$$
- 3.7 State Stefan-Boltzman Law and Wien's law.
 3.8 State Newton's law of cooling.
 3.9 Explain Green house effect.

4. HUMIDITY

- 4.1 Define Standard Temperature and Pressure.
 4.2 Define Humidity, Absolute Humidity, Relative Humidity and Dewpoint.
 4.3 Relation between vapour pressure and air pressure.
 4.4 Determine Humidity by wet and dry bulb hygrometer.
 4.5 Explain few phenomena related to hygrometry.

5. NATURE OF HEAT AND THERMODYNAMICS

- 5.1 Describe the caloric theory and kinetic theory of heat.
 5.2 Explain the mechanical equivalent of heat.
 5.3 State and Explain the first law of thermodynamics .
 5.4 Explain Isothermal and adiabatic change.
 5.5 Explain Specific heat of a gas, Molar specific heat or molar heat capacity.
 5.6 Relate between pressure and volume of a gas in adiabatic Change i, e; $PV^\gamma = \text{const.}$
 5.7 State and Explain Reversible process and irreversible process.
 5.8 State & explain 2nd law of thermodynamics
 5.9 Entropy: Definition, unit and significant.
 5.10 Explain Change of entropy in a reversible and irreversible process.
 5.11 Give an example of increase of entropy in irreversible process.

6. PHOTOMETRY

- 6.1 Define light, medium (transparent, translucent, opaque), luminous & non-luminous bodies, parallel, convergent & divergent of rays.
 6.2 Show the travel of light in straight line.
 6.3 Define photometry, luminous intensity, luminous flux, brightness and illuminating power.
 6.4 Mention relation between luminous intensity & illuminating power.
 6.5 Explain inverse square law of light.
 6.6 Describe the practical uses of light waves in engineering.

7. REFLECTION OF LIGHT

- 7.1 Define mirror (plane & spherical), image (real & virtual) and magnification of images.
 7.2 Describe the reflection of light.
 7.3 State the laws of reflection of light.
 7.4 Express the verification of laws of reflection.
 7.5 Define pole, principal axis, center of curvature, radius of curvature, principal focus in case of concave & convex mirrors.
 7.6 Find the relation between focal length & radius of curvature of a concave & convex mirror.
 7.7 Express the general equation of concave and convex mirror.

8. REFRACTION OF LIGHT

- 8.1 Define refraction of light Give examples of refraction of light
 8.2 State the laws of refraction and Express the verification of laws of refraction
 8.3 Define absolute and relative refractive index and Relate absolute and relative refractive index

- 8.4 Explain the meaning of total internal reflection and critical angle and Relate total internal reflection and critical angle.
- 8.5 Give examples of total internal reflection.
- 8.6 Describe refraction of light through a prism.
- 8.7 Express the deduction of the relation between refractive index, minimum deviation and angle of the prism.
- 8.8 Define lens and mention the kinds of lens.
- 8.9 Identify and List uses of lens.
- 8.10 Express the deduction of the general equation of lens (Concave & convex).

9. ELECTRON, PHOTON AND RADIO-ACTIVITY

- 9.1 Describe Electrical conductivity of gases.
- 9.2 Describe Discharge tube.
- 9.3 Cathode ray : Definition and its properties
- 9.4 X-ray : Definition, properties & uses
- 9.5 Discuss Photo electric effect .
- 9.6 Derive Einstein's photo electric equation
- 9.7 Define and explain radio-activity.
- 9.8 Describe radio-active decay law.
- 9.9 Define half-life and mean-life of radio-active atoms.
- 9.10 Define nuclear fission and fusion.

10. THEORY OF RELATIVITY

- 10.1 Define Space, time and Mass.
- 10.2 Define rest mass.
- 10.3 Express the theory of relativity.
- 10.4 Explain special theory of relativity and its fundamental postulate.
- 10.5 Mention different Kinds of theory of relativity.
- 10.6 The Relativity of Length - Length contraction.
- 10.7 The Relativity of Time – Time dilation.
- 10.8 Deduce Einstein's mass -energy relation

PRACTICAL

1. Compare the operation of common thermometers.
2. Determine the co-efficient of linear expansion of a solid by Pullinger's apparatus.
3. Measure the specific heat capacity of various substances.(Brass, steel).
4. Determine the latent heat of fusion of ice.
5. Determine the water equivalent by calorimeter.
6. Compare the luminous intensity of two different light sources.
7. Verify the laws of reflection.
8. Find out the focal length of a concave mirror.
9. Determine the refractive index of a glass Slab.
10. Determine the angle of Minimum deviation and refractive index of a glass prism by using I-D graph.

REFERENCE BOOKS:

- | | |
|---|-----------------------------------|
| 1. Higher Secondary Physics – Second Part | - by Dr. Shahjahan Tapan |
| 2. A Text Book of Heat and Thermodynamics | - by N Subrahmanyam and Brij Lal |
| 3. A Text Book of Optics | - by N Subrahmanyam and Brij Lal |
| 4. Higher Secondary Physics -Second Part | - by Prof. Golam Hossain Pramanik |
| 5. Higher Secondary Physics -Second Part | - by Ishak Nurfungnabi |
| 6. Thermodynamics | - by K K Ramalingam |

4 Understand areas of circle, sector and segment.

- 4.1 Define circle, circumference, sector and segment.
- 4.2 Find the circumference and area of a circle when its radius is given.
- 4.3 Find the area of sector and segment of a circle.
- 4.4 Solve problems related to the above formulae.

5 Apply the concept of volume of a rectangular solid.

- 5.1 Define rectangular solid and a cube.
- 5.2 Find geometrically the volume of a rectangular solid when its length, breadth and height are given.
- 5.3 Find the volume and diagonal of a cube when side is given.
- 5.4 Solve problems with the help of 6.2 & 6.3.

6 Apply the concept of surface area, volume of a prism, parallelepiped and cylinder.

- 6.1 Define a prism, parallelepiped and a cylinder.
- 6.2 Explain the formulae for areas of curved surfaces of prism, parallelepiped and cylinder.
- 6.3 Explain the formulae for volume of prism, parallelepiped and cylinder when base and height are given.
- 6.4 Solve problems related to 7.2, 7.3.

7 Apply the concept of the surface area, volume of pyramid, cone and sphere.

- 7.1 Define pyramid, cone and sphere.
- 7.2 Explain the formula for areas of curved surfaces of pyramid, cone and sphere.
- 7.3 Explain the formula for volumes of pyramid, cone and sphere.
- 7.4 Solve problems related to 8.2, 8.3.

CO-ORDINATE GEOMETRY

8 Apply the concept of co-ordinates to find lengths and areas.

- 8.1 Explain the co-ordinates of a point.
- 8.2 State different types of co-ordinates of a point.
- 8.3 Find the distance between two points (x_1, y_1) and (x_2, y_2) .
- 8.4 Find the co-ordinates of a point which divides the straight line joining two points in certain ratio.
- 8.5 Find the area of a triangle whose vertices are given.
- 8.6 Solve problems related to co-ordinates of points and distance formula.

9 Apply the concept of locus & the equation of straight lines in calculating various Parameter.

- 9.1 Define locus of a point.
- 9.2 Find the locus of a point.
- 9.3 Solve problems for finding locus of a point under certain conditions.
- 9.4 Describe the Equation $x=a$ and $y=b$ and slope of a straight line.
- 9.5 Find the slope of a straight line passing through two point (x_1, y_1) and (x_2, y_2) .
- 9.6 Find the equation of straight lines:
 - (i) Point slope form.
 - (ii) Slope Intercept form.
 - (iii) Two points form.
 - (iv) Intercept form.
 - (v) Perpendicular form.
- 9.7 Find the point of intersection of two given straight lines.
- 9.8 Find the angle between two given straight lines.
- 9.9 Find the condition of parallelism and perpendicularity of two given straight lines.
- 9.10 Find the distances of a point from a line.

10 Apply the equations of circle, tangent and normal in solving problems.

- 10.1 Define circle, center and radius.
 10.2 Find the equation of a circle in the form:
 (i) $x^2 + y^2 = a^2$
 (ii) $(x - h)^2 + (y - k)^2 = a^2$
 (iii) $x^2 + y^2 + 2gx + 2fy + c = 0$
 10.3 Find the equation of a circle described on the line joining (x_1, y_1) and (x_2, y_2) .
 10.4 Define tangent and normal.
 10.5 Find the condition that a straight line may touch a circle.
 10.6 Find the equations of tangent and normal to a circle at any point.
 10.7 Solve the problems related to equations of circle, tangent and normal.

11 Understand conic or conic sections.

- 11.1 Define conic, focus, Directorx and Eccentricity.
 11.2 Find the equations of parabola, ellipse and hyperbola.
 11.3 Solve problems related to parabola, ellipse and hyperbola.

VECTOR :**12 Apply the theorems of vector algebra.**

- 12.1 Define scalar and vector.
 12.2 Explain null vector, free vector, like vector, equal vector, collinear vector, unit vector, position vector, addition and subtraction of vectors, linear combination, direction cosines and direction ratios, dependent and independent vectors, scalar fields and vector field.
 12.3 Prove the laws of vector algebra.
 12.4 Resolve a vector in space along three mutually perpendicular directions
 12.5 Solve problems involving addition and subtraction of vectors.

13 Apply the concept of dot product and cross product of vectors.

- 13.1 Define dot product and cross product of vectors.
 13.2 Interpret dot product and cross product of vector geometrically.
 13.3 Deduce the condition of parallelism and perpendicularity of two vectors.
 13.4 Prove the distributive law of dot product and cross product of vector.
 13.5 Explain the scalar triple product and vector triple product.
 13.6 Solve problems involving dot product and cross product.

Reference

SL No	Athour	Title	Publication
01	G. V. Kumbhojkar	Companion to basic Maths	Phadke Prakashan
02	Murary R Spigel	Vector & Tensor Analysis	Schaum's Outline Series
03	Md. Abu Yousuf	Vector & Tensor Analysis	Mamun Brothers
04	Rahman & Bhattacharjee	Co-ordinate Geometry & Vector Analysis	H.L. Bhattacharjee
05	Md. Nurul Islam	Higher Mathematics	Akkhar Patra Prakashani

Full Marks: 100 (Practical-50.Theoretical-50)

Introduction

This Course Will Provide A Unique Foundation In The Basic Level For Developing Listening, Speaking, Reading And Writing Skills Into Some Of More Specialized And Advanced Capabilities Of Basic Operation In Communication.

Theory Part

Total Mark: : 50
 Continuous Assessment : 20
 Final Exam : 30

Objectives:

After The Completion of the Module, Learners Will Be Able To Develop-

- # Creative Writing Ability
- # Transferring Information, Ideas And Knowledge
- # Communicative Competence Effectively In The Workplace Situation.

1.Comprehension For Reading Task (Mark:10)

(Text May Be Taken From Contemporary Journals, Editorial of News Papers Or From Online Resources)

Test Items:

1. MCQ (Guessing Meaning from Context)
2. Rearranging
3. Gap-Filling (With Clues or Without Clues)
4. Answering Questions
5. Summarizing

2. Composition (Mark: 20)

The Following Are The Topic Title Introduced For Writing Task:

1. Introduce Formal/Informal Greeting & Farewell
2. Describe The Idea Of Communication & Presentation Skills
3. Write Paragraph On The Basis Of Comparison and Contrast
4. Narrate Process, Stories And Interpreted Charts, Graphs.
5. Write Letters to the Print and Electronic Media
6. Write Letters of Advice, Complaints, Inquiry, Order and Cancellation
6. Prepare Seven Days Weather Report.
7. Make An Attractive Poster For The People Giving Advice To Protect The Environment.
8. Prepare A Series Of Questions About Personal Information, Place Of Interest, Foods, Hobby And Employment Opportunity.
9. Write Dialogue On The Following Situations
 - # About Exchanging Views With A Person And Introducing One Narrating Daily Activities
 - # Meeting At The Train Station & Asking Question About The Departure And Arrival Of The Train To The Station Manager
 - # Meeting at The Airport And Asking The Flight Schedule
 - # Getting To The Hotel And Asking For A Reservation
 - # Social Language for Telephonic Conversation
 - # Talking About the Weather, Trips & Sight Seeing
 - # Asking Permission and Making Request.
 - # Talking About Office and Office Manner
 - # Talking About Etiquette and Manner
10. Prepare Job Application With A Complete CV For Job Suitable For You.

Practical Part:

Objectives:

1. Communicate The Areas That Learners Encounter In Real Life Situation.
2. Reinforce The Basic Language Skills Of Listening And Speaking.
3. Integrate ICT As Tools In Learning Language.

Course Content

Unit	Lesson	Title
1. Use Of Dictionary	Define Dictionary	1.1 Know How To Use A Dictionary 1.2 Learn At Least 10 Words In A Day With Correct Pronunciation (Follow The Link : Www.Marriunm-Englishdictionary.Com)
2. Basic Vocabulary Practice	Basic Words For Communication By ODGENS	2.1 Use 10 Most Common Formulas (Structure) To Write Correct Sentence. (Follow The Link: Www.Odgenbasicvocabulary.Com Www.Grammarly.Com)
3. Listening Skill Practice	Listen To The Audio Video Presentation On Current Real Life Situation	3.1 Practice Audio Video Conferencing Activities. 3.2. Communicate With The English Speaking People Online (Link: Www.Speaking24.Com)
4. Speaking Skill Practice (Self Interpretation)	Introduce Yourself With The Vocabulary Prescribed By ODGENS	4.1 Browse Vocabulary Related Phrases To Introduce You. (Link : Www.Youtube.Com/ Let Me Introduce Myself)
5. Listening Skill Practice	Listen To The Weather Reports, Sports Commentary In The English TV Channels.	5.1 Prepare Seven Days Weather Report For The Place You Are Staying. 5.2. Make Some Attractive Poster To Protect The Environment.
6. Speaking Skill Practice	Identify Formal And Informal Social Language	6. 1 Practice Conversation Emphasizing On Greetings & Farewell (Link- Www.Esl.Guide@About.Com) 6.2 Take Part In Audio Video Conferencing Activities 6.3 Ask Questions About Personal Information, Place Of Interest, Food, Hobby, Employment Opportunity With Foreign Friends Using Social Media.
7. Writing Skill Practice	Develop Paragraph	7.1 Develop Paragraph On The Basis Of Comparison, Contrast And Analysis. Check Plagiarism Wordiness By The Correction Software (Www.Grammarly.Com) 7.2. Write E-Mail, Send And Reply E-Mail

8. Listening Skill Practice	Watch Short Films, Documentary And Listen To The English Music(With Lyric) To Practice In A Group	8.1 Listen To Hard Talk, Interview 8.2. Prepare A Series Of Questions To Interview A Celebrity 8.3. Down Load Documentary From Www.Youtube.Com/Education
9. Presentation	Define Presentation	9.1 Edutain/Entertain Yourself Preparing A Documentary In A Group With The Activities Done During The Period Of Class Hours In The Lab For Communicative English.

Evaluation:

Students Can Be Evaluated Individually Or In A Group On The Basis Of Performance Done In The Lab. Furthermore, They May Be Given Online Test Using Authenticated Websites Like

www.Britishcouncil.Org/Education/Blog/Podcast/News/Weather, www.Englishteststore.Com, www.Ieltsexam.Com

Lab-Facilitator, 30 Students In A Group:

Physical Facility	Size (In Ft)	Area (In Sq Ft)
Class Room Cum Laboratory	15 × 20	300
Library	15 × 20	300
Wash Room	4 × 7	28

Lists Of Equipments And Resources For 30 Learners:

Personal Computers With Accessories	15
Projector Multimedia	01
Printer	01
Scanner	01
Modem	01
Essential Software	01 Set
Internet Connection For Each Computer	Broad Band/Dial Up
Camera (Digital)	01
Video Conferencing Equipments	01 Set
TV Card	01
Satellite Cable Connection	01
Head Phone	15
Related Books And Journals	01
First Aid Box	01

Reference:

www.Britishcouncil.Org, www.Marium-Websters.Com, www.Compellingconversation.Com,
www.Esl.Guide@About.Com, www.Bbc.Com/News, www.Speaking24.Com, www.Itutor.Com,
www.Ieltsexam.Com, www.Englishteststore.Com, www.Ginger.Com, www.Grammarly.Com

(Note: This Course May Be Introduced After Fourth Semester Coz It Needs Some Maturity Of The Students To Adopt With The Course Materials And The Contents. These Themes Are Suggestive Not Prescriptive.)