

No	Information of every subject	
1	Unit name:	Basic Electronics
2	Code:	EP 21014
3	Classification:	Engineering subject
4	Credit value:	2.5
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	PEE
7	Mode of delivery:	Lecture, Practical
8	Assessment system and breakdown of marks:	
	Test	20%
	Mid-term Examination	30%
9	Academic staff teaching unit:	
10	<p>Course outcome of unit:</p> <p>In this course students will be able</p> <ul style="list-style-type: none"> <li>To explain the structure of an atom, materials used in electronics, N-type and P-type semiconductors and the functions of diode, special purpose diode, rectifier, transistors ( BJTSs, MOSFET, FET, JFET),transistor biasing.</li> <li>To calculate the problems of diode , special purpose diode ,rectifier and transistor (characteristics of BJT transistor operation used as a switch and an amplifier) related with their characteristics.</li> <li>To construct power supply circuit, the half wave rectifier circuit and full wave bridge rectifier circuit using required equipment and Multisim (or)Proteus Software.</li> </ul>	
11	<p>Synopsis of unit:</p> <p>EP-21014 &amp; EP-22014 : Basic Electronics I &amp; II. The course covers the fundamental of basic electronics. The course introduces students to understand the types of basic electronics and the applications of power electronics devices, diodes,</p>	

rectifier, bipolar junction transistors, field effect transistors.

Topic:

**Chapter      Title**

### **1. Introduction to Electronic**

- Introduction
- The Atom
- Material used in Electronics
- Current in Semiconductors
- N-Type and P-Type Semiconductors
- The PN Junction

### **2. Diodes and Applications**

- Diode Operation
- Voltage-Current (V-I) Characteristics of a diode
- Diode Models
- Half-Wave and full-wave Rectifiers
- Power Supply Filters and Regulators
- Diode Limiters and Clampers
- Voltage Multipliers

### **3. Special-Purpose Diodes**

- The Zener Diode
- Zener Diode Applications
- The Varactor Diode
- Optical Diodes
- Other Types of Diodes

### **4. Bipolar Junction Transistors**

	<ul style="list-style-type: none"> <li>-Bipolar Junction Transistors (BJT) Structure</li> <li>-Basic BJT Operation</li> <li>-BJT Characteristics and Parameters</li> <li>-The BJT as an Amplifier and a Switch</li> <li>-The Phototransistor</li> <li>-Transistor Categories and Packaging</li> </ul> <p><b>5. Transistor Bias Circuits</b></p> <ul style="list-style-type: none"> <li>-The DC Operating Point</li> <li>-Voltage-Divider Bias</li> <li>-Other Bias Methods</li> </ul> <p><b>8. Field-Effect Transistors (FETs)</b></p> <ul style="list-style-type: none"> <li>-The JFET</li> <li>-JFET Characteristics and Parameters</li> <li>- JFET Biasing</li> <li>-The MOSFET</li> <li>- MOSFET Characteristics and Parameters</li> <li>- MOSFET Biasing</li> <li>- The IGBT</li> </ul>
14	<p><b>Main references:</b></p> <ol style="list-style-type: none"> <li>1. Electronic Devices, Conventional Current Version, Ninth Edition, Thomas L. Floyd.</li> <li>2. Thomas L. Floyd. Digital Fundamental, Ninth Edition, Wiley.</li> </ol>
15	<p>Additional references:</p> <p>Electric Engineering Materials and Device , TATA MCGRAW-HILL EDITION, JOHN ALLISON</p> <p>Basic Electronics ,A TEXT-LAB MANUAL ,Zbar Malvino Millor , Seventh Edition</p>

## Information on Lab Practical

1	<p><b>JOB 1: Junction Diode Characteristics (Forward Bias and Reverse Bias)</b></p> <p><b>Objective :</b></p> <ul style="list-style-type: none"><li>-To measure the effects of forward and reverse bias on current in a junction diode.</li><li>-To experiment and graph the volt-ampere characteristics of a junction diode.</li><li>-To test a junction diode with an ohmmeter</li></ul> <p><b>EQUIPMENT REQUIRED</b></p> <ol style="list-style-type: none"><li>1. Diode</li><li>2. Resistor</li><li>3. Basic Electronic Trainer Base Station</li><li>4. Module(EFT-ETX-M1)</li><li>5. Digital Multimeter</li><li>6. Jumper cables</li></ol>
2	<p><b>JOB-2 Half Wave Rectifier Circuit testing with Oscilloscope</b></p> <p><b>Objective :</b></p> <ul style="list-style-type: none"><li>-To understand the work operation of application equipment</li><li>-To realize the operation of half wave rectifier circuit</li><li>-To construct the half wave rectifier circuit</li><li>-To observe and measure the output waveforms of a half-wave rectifier</li><li>-To understand the usage of oscilloscope</li></ul> <p><b>EQUIPMENT REQUIRED</b></p> <ol style="list-style-type: none"><li>1. Diode</li><li>2. Resistor</li><li>3. 12V AC</li><li>4. Basic Electronic Trainer Base Station</li><li>5. Module(EFT-ETX-M1)</li><li>6. Digital Multimeter</li><li>7. Jumper cables</li></ol>
3	<p><b>JOB-3 Full Wave Bridge Rectifier Circuit</b></p> <p><b>Objective :</b></p> <ul style="list-style-type: none"><li>• To understand the work operation of application equipment</li><li>• To realize the operation of Full wave bridge rectifier circuit</li><li>• To construct the Full wave bridge rectifier circuit using with multism</li></ul>

	<p>software</p> <ul style="list-style-type: none"> <li>• To measure the voltage of the Full wave bridge rectifier circuit</li> </ul> <p><b>EQUIPMENT REQUIRED</b></p> <ol style="list-style-type: none"> <li>1. Diode (Bridge rectifier)</li> <li>2. Transformer</li> <li>3. Resistor</li> <li>4. Capacitor</li> <li>5. Oscilloscope</li> <li>6. MultiMeter</li> <li>7. AC source</li> <li>8. multism Software and PC</li> </ol>
4	<p><b>JOB-4 Basic DC Power Supply(Multisim Software)</b></p> <p>Objective :</p> <p>Upon the completion of this activity, the student must be able to</p> <ul style="list-style-type: none"> <li>-To understand the work operation of application equipment</li> <li>- To measure the effects of filter elements on the DC output voltage and ripple</li> <li>-To construct the DC power supply circuit using Multisim Software</li> </ul> <p><b>EQUIPMENT REQUIRED</b></p> <ol style="list-style-type: none"> <li>1. 12V step down Transformer</li> <li>2. Rectifier</li> <li>3. Capacitor (500uF/1000uF)</li> <li>4. Regulator(7805/7809/7815)</li> <li>5. PC and Multisim Software</li> </ol>
5	<p><b>JOB-5 Basic DC Power Supply using project board</b></p> <p>Objective :</p> <p>Upon the completion of this activity, the student must be able to</p> <ul style="list-style-type: none"> <li>-To understand the work operation of application equipment</li> <li>- To measure the effects of filter elements on the DC output voltage</li> <li>-To construct the DC power supply circuit</li> </ul> <p><b>EQUIPMENT REQUIRED</b></p> <ol style="list-style-type: none"> <li>1. 12V step down Transformer</li> <li>2. Rectifier</li> <li>3. Capacitor (500uF/1000uF)</li> </ol>

	<ul style="list-style-type: none"><li>4. Regulator(7805/7809/7812)</li><li>5. Project board</li><li>6. Wire</li></ul>
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Approved By:

Prepared By:

ဒေါက်တာနေကြည်ထွေး

ပါမောက္ခဌာနမှူး

လျှပ်စစ်စွမ်းအားအင်ဂျင်နီယာဌာန  
နည်းပညာတက္ကသိုလ်(ကျောက်ဆည်)

ဒေါ်နီလာအောင်

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လျှပ်စစ်စွမ်းအားအင်ဂျင်နီယာဌာန  
နည်းပညာတက္ကသိုလ်(ကျောက်ဆည်)