

As Per NEP 2020

University of Mumbai



Syllabus for Basket of Minor	
Board of Studies in Physics	
UG First Year Programme	
Semester	II
Title of Paper: Basic Electronics	Credits 2
I)	
II)	
III)	
From the Academic Year	2024-25

Sr. No.	Heading	Particulars
1	Description the course : Including but Not limited to :	Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc.
2	Vertical :	Minor (Choose By \surd)
3	Type :	Theory
4	Credit:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted :	30 Hours / 60 Hours
6	Marks Allotted:	50 Marks /100 Marks
7	Course Objectives: (List some of the course objectives) After successful completion of this course students will be able to: <ol style="list-style-type: none"> 1. To impart knowledge of basic concepts in Electronics. 2. To provide the skills and methods required to construct electronic circuits 3. To provide exposure of linear and digital electronics circuits. 	
8	Course Outcomes: (List some of the course outcomes) On successful completion of this course students will be able to: <ol style="list-style-type: none"> 1. Understand basic concept of electronic devices resistors, capacitors, inductors, transformers and P-N Junction diode. 2. Understand the basic concept of AC generator, basic terms, phasor diagram, AC circuit using Resistance, Capacitance and Inductance. 3. Apply knowledge to develop circuits using electronic devices. 	
9	Modules: - Per credit One module can be created	

Module 1: Unit 1: Basic Circuit Components**(15 Lectures)**

- 1. Resistors:** Introduction of resistor, units, Resistor value using Color Code, Resistive circuits: Series circuit, characteristics of series circuit, series voltage divider, open and short in series circuit, Parallel circuit, laws of parallel circuit, open and short in parallel circuit.
- 2. Capacitors:** Principles of capacitance, units, color code, capacitors in series and parallel.
- 3. Inductors:** Introduction, units, inductor color code, self and mutual inductance, Inductance in series and parallel
- 4. Transformers:** Introduction, Step-up and Step-down Transformers, Turn-Ratio, Voltage and Current Ratio.
- 5. P-N Junction Diode:** construction, formation of depletion layer, forward and reverse biasing, and I-V characteristics.

Module 2: Unit 2: AC Fundamentals**(15 Lectures)**

Types of Alternating Waveforms, Basic AC Generator, Definitions of Cycle, Time Period, Frequency and Amplitude, Characteristics of a Sine Wave, Audio and Radio Frequencies, Different Values of Sinusoidal Voltage and Current, Average and RMS value of AC, Phase of an AC, Phasor Diagram, Vector Representation of an Alternating Quantity, AC through pure resistance, inductance and capacitance. Concept of Reactance and Impedance, Application of AC.

10	Reference Books: <ol style="list-style-type: none"> 1. Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004) 2. Electrical Circuits, M. Nahvi, J. Edminister, Schaum's Outline Series, Tata McGraw-Hill 3. Electrical Circuits, K.A. Smith and R.E. Alley (2014) Cambridge University Press 4. Network, Lines and Fields, J.D.Ryder, Prentice Hall of India. 	
11	Internal Continuous Assessment: 40%	External, Semester End Examination Individual Passing in Internal and External Examination : 60%
12	Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	

13	<p>Format of Question Paper for Minor: External – 60% (30 Marks) Internal – 40% (20 Marks) Question Paper Format for 30 Marks Duration: One Hours</p>	(2 Credits)						
Attempt any Four Questions out of Six from the following.								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;">1) Answer the following questions</td> <td style="text-align: right; padding: 5px;">(15 Marks)</td> </tr> <tr> <td style="padding: 5px;"> i) Theory (Unit-I)</td> <td style="text-align: right; padding: 5px;">(8 Marks)</td> </tr> <tr> <td style="padding: 5px;"> ii) Theory (Unit-II)</td> <td style="text-align: right; padding: 5px;">(7 Marks)</td> </tr> </table>			1) Answer the following questions	(15 Marks)	i) Theory (Unit-I)	(8 Marks)	ii) Theory (Unit-II)	(7 Marks)
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**Sign of the BOS
Chairman
Dr. T.N. Ghorude
Board of Studies in
Physics**

**Sign of the
Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science &
Technology**

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