

GOVERNMENT POLYTECHNIC, PUNE
(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	Diploma in ME / MT
Programme Code	:	04/ 05 /18/19
Name of Course	:	Elements of Electronics Engineering
Course Code	:	ET 285

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3 hrs.	--	--	--
Marks	20	80	--	--	25

Course Rationale:

This course will be useful in understanding of construction, working and applications of semiconductor devices and circuits.

Course Objectives:

After studying this course, the student will be able to

- Explain construction, working, characteristics and applications of semiconductor devices and circuits.
- Build and test the circuits

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Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
1.	Semiconductor devices			
	1.1	1 Semiconductor theory Types : 1] intrinsic Semiconductor 2] Extrinsic semiconductor - P – type and N - type semiconductor. PN junction diode: Diode symbol, Working, Barrier voltage, depletion region, Junction Capacitance, Forward & reverse Characteristics.	15	20
	1.2	Zener diode : Diode symbol, Working, Forward & reverse Characteristics Avalanche & zener breakdown.		
	1.3	Rectifier : Definition , Classification Half wave and Full wave Rectifier: circuit diagram, working, comparison, merits and demerits. Filters, necessity, types , comparison, merits, demerits		
	1.4	Transistor : construction, symbol, operating principle, characteristics, configurations, comparison between CB, CE, CC ,applications		
	1.5	FET: Classification of FET : Construction, symbol, operating principle, characteristics, and applications of JFET.		
	1.6	SCR : Symbol, their construction, working, characteristics, applications		
2.	Oscillator			
	2.1	Block diagram, Barkhausen Criteria for sustained oscillations, Oscillations in LC tank circuit; Classification: LC and RC. Classification of RC Oscillator: Working of RC Phase shift & Wein Bridge Oscillator. Clasification of LC Oscillator: Working of Hartley, Colpitts, and Crystal Oscillator.	07	12
3.	Digital Fundamentals			
	3.1	Number systems: Decimal, Binary, Hexadecimal, Octal.		
	3.2	Basic logic gates: AND, OR, NOT, NAND, NOR, EXOR symbols, IC numbers and Truth Table.	07	12

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	3.3	Boolean Algebra: Fundamentals of Boolean algebra, Basic laws, De Morgan's theorem		
4.	Linear ICs,			
	4.1	OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting, Non Inverting amplifier, Difference amplifier, adder, subtractor, Integrator, differentiator. (using closed loop system)	07	12
5.	Instrumentation			
	5.1	CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications.	05	12
	5.2	Function generator, Block diagram, operation, specifications, applications		
6.	Transducer			
	6.1	Definition, Selection criteria of Transducer. Classification: Active, Passive, Primary, Secondary, Mechanical, Electronic, Analog, Digital, Resistive, Capacitive, Inductive Transducers. Construction, Operation, Applications : LVDT, RTD, Thermocouple, Photoelectric, Piezoelectric Transducers,	07	12
Total			48	80

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Plot V-I characteristics of P-N junction diode.	02
2.	Study of Half wave and Full wave rectifier with and without filter.	02
3.	Plot the i/p and o/p characteristics in CE configurations.	02
4.	Plot the characteristics of FET.	02
5.	Plot the characteristics of SCR.	02
6.	Study of Hartley and Colpitts oscillator.	02
7.	Study of RC phase shift and Wein Bridge.	02
8.	Study of logic gates and verifications of logic gates.	02
9.	Verification of De Morgan's theorem.	02
10.	Study of Inverting and Non Inverting Amplifier.	02
11.	Study of Adder, Subtractor.	02
12.	Study of Integrator and Differentiator.	02
13.	Study of C.R.O.	02
14.	Study of Function generator.	02
15.	Study of Transducers.	02

Instructional Strategy:

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Sr. No.	Topic	Instructional Strategy
1.	Semiconductor devices.	Classroom teaching and laboratory work.
2.	Digital fundamentals.	Classroom teaching and laboratory work.
3.	Linear IC`s.	Classroom teaching and laboratory work.
4.	Oscillator.	Classroom teaching and laboratory work.
5.	Instrumentation.	Classroom teaching and laboratory work.
6.	Transducer.	Classroom teaching and laboratory work.

Text Books:

Sr. No	Author	Title	Publication
1.	V.K. Mehata	Principle of Electronics	TMH.
2.	R.S.Sedha	Applied Electronics	TMH.
3.	B.L.Theraja.	Basic Electronics.	S.Chand.
4.	Ramakant Gaikwad	Linear Integrated Circuits	PHI
5.	R P Jain	Modern Digital Electronics	TMH
6.	H.S. Kalsi	Electronics Instrumentation	TMH

Reference Books:

Sr. No	Author	Title	Publication
1.	Mottershed	Electronics Devices and Circuits.	PHI
2.	Milman Halkies	Electronics Devices and Circuits.	TMH

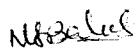


Learning Resources: Reference Books, Data Manual

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Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Semiconductor Devices	10	06	04	20
2.	Oscillators	04	06	02	12
3.	Digital Fundamentals	06	04	02	12
4.	Linear I C 's	06	04	02	12
5.	Instrumentation	06	04	02	12
6.	Transducers	06	04	02	12
Total		38	28	14	80

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