

Department of Electronics & Communication and Engineering

Course File

ELECTRONIC DEVICES AND CIRCUITS

(Course Code: EC205ES)

I B.Tech II Semester

2023-24

Mr.L.Hari Prasad
Assistant Professor



Department of ECE

ELECTRONIC DEVICES AND CIRCUITS

Check List

S.No	Name of the Format	Page No.
1	Syllabus	3
2	Timetable	5
3	Program Educational Objectives	8
4	Program Outcomes	9
5	Course Objectives	11
6	Course Outcomes	11
7	Guidelines to study the course	12
8	Course Schedule	13
9	Course Plan	14
10	Unit Plan	17
11	Lesson Plan	17
12	Assignment Sheets	41
13	Tutorial Sheets	46
14	Evaluation Strategy	51
15	Course completion status	52
16	Assessment in relation to CO's and CO's	53
17	Mappings of CO's and PO's	53
18	Rubric for course	54
19	Mid-I and Mid-II question papers	55
20	Mid-I& Mid-II mark	57
21	Sample answer scripts and Assignments	60
22	Course materials like Notes, PPT's, etc.	61
23	Course Completion Certificate	63

(Highlighted parts has to be revised by individual faculty)

Department of ECE**ELECTRONIC DEVICES AND CIRCUITS****Int. Marks:40 Ext. Marks:60 Total Marks:100****(Common to ECE,CSE,IT&AIML)****Course Code: EC205ES**

UNIT –I: Diodes: Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics of Diode, Diode as a switch- switching times.

UNIT –II: Diode Applications: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters,

Clippers and Clampers: Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.

UNIT - III: Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.

UNIT -IV: Junction Field Effect Transistor (FET): Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.

UNIT –V: Special Purpose Devices: Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.

Text Books:

1. Electronic Devices and Circuits - J.Millman, C.C.Halkias, and SatyabrathaJit Tata McGraw Hill, 2nd Ed.,2007.
2. Electronic Devices and Circuits - R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9thEdition,2006.
3. Introduction to Electronic Devices and Circuits- Rober T. PaynterPE

Department of ECE

Reference Books:

1. Electronic Devices and Circuits - T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition,2004.
2. Principles of Electronic Circuits - S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn...,1998.
3. Microelectronics - Millman and Grabel, Tata McGraw Hill,1988. 4. Electronic Devices and Circuits - Dr. K. LalKishore,B.S.

Department of ECE

**ANURAG ENGINEERING COLLEGE**

Aananthagiri(V&M),Suryapet(Dt)-508206A.PPh:08683-272555,272456,272221

Academic Year 2023-24

IB.Tech II Semester Consolidated Time Table

w.e.f.02.05-2024

DAY /PERIOD	Branch	I	II	BREAK	III	BREAK	IV	V	BREAK	VI	VII
		09.30 - 10:20	10.20 - 11.10	11.10 - 11.20	11.20 - 12.10	12.10 - 12.50	12.50 - 01.35	01.35 - 02.20	02.20 - 02.30	02.30- 3.03.15	15- 04.00
MON	ECE	CAEG				LB UR NE CA HK	ODE	BEE		EDC	Games/Library
	CSE-A	ODE	AP		ESE			AP		ODE	EDC
	CSE-B	AP	EDC		ES		ODE	ELCSLAB			
	CSE-C	EDC	ODE		AP		ODE	AP		EDC	ESE
	IT	ODE	BEE		EC		EDC	ODE		BEE	EC
	AIML-A	EDC	ODE		AP		ESE	AP/EWSLAB			
	AIML-B	ESE	EDC		ODE		AP	EDC		ODE	AP
TUE	ECE	CAEG				LB UR NE CA HK	EC	EDC		BEE	ODE
	CSE-A	EDC	AP		ODE		ESE	AP/EWSLAB			
	CSE-B	AP/EWSLAB					AP	ODE		EDC	ESE
	CSE-C	ODE	AP		EDC		ES	AP		ESE	EDC
	IT	EDC	ODE		BEE		EC	EC/BEELAB			
	AIML-A	AP	ODE		EDC		PYTL	AP		ODE	ESE
	AIML-B	ES	CRE		ODE		EDC	ESE		AP	Games/Library
WED	ECE	EC/BEELAB				LB UR NE CA HK	BEE	ODE		EDC	EC
	CSE-A	AP	CRE		EDC		ODE	PYTL		ES	Games/Library
	CSE-B	AP	EDC		ODE		ESE	AP		ODE	EDC
	CSE-C	CRE	AP		ODE		ESE	AP/EWSLAB			
	IT	BEE	EC		EDC		EDC	BEE		ODE	Games/Library
	AIML-A	ELCSLAB					ES	AP		ODE	ES
	AIML-B	EDC	ODE		AP		CRE	ELCSLAB			
THU	ECE	EDC	ODE		BEE	LB UR NE CA HK	EC	ODE		EC	BEE
	CSE-A	ESE	AP		EDC		CRE	AP		ES	ODE
	CSE-B	ESE	AP		ODE		ES	AP/EWSLAB			
	CSE-C	ELCSLAB					PYTL	ODE		AP	EDC
	IT	EC/BEELAB					BEE	EC		ODE	COI
	AIML-A	ODE	EDC		AP		EDC	AP		ESE	CRE
	AIML-B	AP/EWSLAB					PYTL	ODE		AP	ESE
FRI	ECE	COI	EC		ODE	LB UR NE CA HK	EDC	EC/BEELAB			
	CSE-A	ESE	AP		EDC		ODE	AP/EWSLAB			
	CSE-B	EDC	AP		ESE		AP	ODE		EDC	CRE
	CSE-C	ODE	ES		EDC		CRE	AP		ESE	Games/Library
	IT	CAEG					BEE	EDC		EC	ODE
	AIML-A	EDC	ODE		ESE		ES	AP		CRE	Games/Library
	AIML-B	AP/EWSLAB					ESE	ODE		AP	EDC
SAT	ECE	COI	BEE		EC	LB UR NE CA HK	EDC	BEE		ODE	EC
	CSE-A	ESE	AP		EDC		ODE	ELCSLAB			
	CSE-B	ESE	CRE		AP		EDC	ODE		PYTL	Games/Library
	CSE-C	AP/EWSLAB					ESE	ODE		EDC	AP
	IT	EC	ODE		EDC		COI	CAEG			
	AIML-A	EDC	AP		ODE		ESE	AP/EWSLAB			
	AIML-B	AP	ODE		EDC		ES	ESE		AP	EDC

Department of ECE**TIME TABLE****I B.Tech. II Semester –ECE(A SEC)**

Day/Hour	9.30-10.20	10.20-11.10	11.20-12.10	12.10-12.50	12.50-1.35	1.35-2.20	2.30-3.15	3.15-4.00
Monday							EDC	
Tuesday						EDC		
Wednesday							EDC	
Thursday	EDC							
Friday								
Saturday				EDC				

Department of ECE

Vision of the Institute

To be a premier Institute in the country and region for the study of Engineering, Technology and Management by maintaining high academic standards which promotes the analytical thinking and independent judgment among the prime stakeholders, enabling them to function responsibly in the globalized society.

Mission of the Institute

To be a world-class Institute, achieving excellence in teaching, research and consultancy in cutting-edge Technologies and be in the service of society in promoting continued education in Engineering, Technology and Management.

Quality Policy

To ensure high standards in imparting professional education by providing world-class infrastructure, top-quality-faculty and decent work culture to sculpt the students into Socially Responsible Professionals through creative team-work, innovation and research.

Vision of the Department

To generate competent professionals to become part of the Industry and Research Organizations at the National and International levels.

Mission of the Department

- To train the students to have in-depth knowledge of the subjects in the field of Computer Science and Engineering.
- To train the students with leadership qualities, team work skills, commitment and ethics thereby making them develop confidence for R & D activities and for placement in multinational and national.

Department of ECE

Program Educational Objectives (B.Tech. –ECE)

Graduates will be able to

- PEO 1: Graduates will have broad scientific and engineering knowledge to formulate, analyse and resolve engineering issues in real world.
- PEO 2: Graduates will have the skills they need for a successful career in Electronics & Communications and related fields that meet the needs of the country and businesses.
- PEO 3: Graduates will function effectively in workplace with demonstrable attributes like leadership, lifelong learning, and teamwork in order to meet the requirements of society.

Department of ECE

Program Outcomes (B.Tech. –ECE)

At the end of the Program, a graduate will have the ability to

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage

Department of ECE

projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department of ECE

COURSE OBJECTIVES

On completion of this Subject/Course the student shall be able to:

S.No	Objectives
1	To introduce components such as diodes,.
2	To know the applications of Diode.
3	To understand the characteristics of the BJT.
4	To understand the characteristics of the JFET and MOSFET.
5	To understand the characteristics of the special purpose devices.

COURSE OUTCOMES

The expected outcomes of the Course/Subject are:

S.No	Outcomes
1.	Analyze the PN Junction diode operation and its characteristics
2.	Know the applications of Diode such as clippers and clampers.
3.	Analyze the characteristics of BJT.
4.	Analyze the characteristics of FET.
5.	Understand the concept of special purpose devices

Signature of faculty

Note: Please refer to Bloom's Taxonomy, to know the illustrative verbs that can be used to state the outcomes.

Department of ECE

GUIDELINES TO STUDY THE COURSE / SUBJECT

Course Design and Delivery System (CDD):

- The Course syllabus is written into number of learning objectives and outcomes.
- Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
- The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

The faculty be able to –

- Understand the principles of Learning
- Understand the psychology of students
- Develop instructional objectives for a given topic
- Prepare course, unit and lesson plans
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback to students using various methods of Assessments and tools of Evaluation
- Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

COURSE SCHEDULE (I ECE)

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	Unit-I: Diodes Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics of Diode, Diode as a switch- switching times.	5.2.2024	24.2.2024	15
2.	Unit-II: Diode Applications Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters Clippers and Clampers: Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.	26.2.2024	19.3.2024	15
3.	Unit-III: Bipolar Junction Transistor (BJT) Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.	21.3.2024	18.4.2024	7
4.	Unit-IV: Junction Field Effect Transistor (FET) Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.	19.4.2024	6.5.2024	10
5.	Unit-V: Special Purpose Devices Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.	7.5.2024	12.6.2024	10

Total No. of Instructional periods available for the course: 63 Hours + 2hr (Mid-I Exam)

Department of ECE

SCHEDULE OF INSTRUCTIONS - COURSE PLAN

Unit No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	References (Textbook, Journal)
1.	1	5.2.2024 7.2.2024	2	Introduction to Electronic Devices and Circuits, Classification of semiconductor materials	1 1	Electronic Devices and Circuits - J.Millman
	2	8.2.2024 9.2.2024	2	Unit-I: Introduction to PN Junction Diode, PN junction as a Diode	1 1	Electronic Devices and Circuits - J.Millman
	3	12.2.2024 15.2.2024	2	Working of PN Junction Diode, V-I Characteristics of PN Junction Diode	1 1	Electronic Devices and Circuits - J.Millman
	4	16.2.2024 17.2.2024	2	Diode current equation, Effect of temperature on V-I characteristics of Diode	1 1	Electronic Devices and Circuits - J.Millman
	5	19.2.2024	2	Diode equivalent circuits	1 1	Electronic Devices and Circuits - J.Millman
	6	21.2.2024	1	Diode resistances: Static & Dynamic resistances	1	Electronic Devices and Circuits - J.Millman
	7	22.2.2024	2	Diffusion capacitance, Transition capacitance	1	Electronic Devices and Circuits - J.Millman
	8	23.2.2024 24.2.2024	2	Diode as a switch, Diode switching times and its characteristics	1 1	Electronic Devices and Circuits - J.Millman
2.	1	26.2.2024 28.2.2024	2	Problems based on Diodes, Unit –II: Introduction to Diode applications	2 2	Electronic Devices and Circuits - R.L. Boylestad
	2	29.2.2024	1	Half wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	3	1.3.2024	2	Center-tapped Full wave Rectifier, Bridge full wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	4	4.3.2024	2	Comparison of Rectifiers,	2	Electronic Devices and

Department of ECE

		6.3.2024		Capacitor filter with Rectifiers	2	Circuits - R.L. Boylestad
	5	7.3.2024 11.3.2024	2	Inductor filter with Rectifiers, Clippers, Classification of clippers	2 2	Electronic Devices and Circuits - R.L. Boylestad
	6	13.3.2024 14.3.2024	2	Series and shunt clipper, Clipping at two independent levels	2 2	Electronic Devices and Circuits - R.L. Boylestad
	7	15.3.2024	2	Clampers, Classification of clampers	2 2	Electronic Devices and Circuits - R.L. Boylestad
	8	16.3.2024 16.3.2024	2	Negative Clamper, Positive Clamper	2 2	Electronic Devices and Circuits - R.L. Boylestad
	9	18.3.2024 19.3.2024	2	Clamping circuit theorem, Problems based on Diode applications	2 2	Electronic Devices and Circuits - R.L. Boylestad
3.	1	21.3.2024	1	Unit III: Introduction to BJT	3	Electronic Devices and Circuits - J.Millman
	2	22.3.2024	1	Construction and operation of BJT(NPN&PNP)	3	Electronic Devices and Circuits - J.Millman
	3	23.3.2024	1	Common Base Configuration	3	
	3	27.3.2024	1	Common Emitter Configuration	3	Electronic Devices and Circuits - J.Millman
	4	28.3.2024	1	Common Collector Configuration	3	Electronic Devices and Circuits - J.Millman
	5	30.3.2024	1	Relation between Alpha, Beta & Gamma	3	Electronic Devices and Circuits - J.Millman
	6	2.4.2024	2	Mid-I Exam		
	7	18.4.2023	1	Transistor as a switch & switching times	3	Electronic Devices and Circuits - J.Millman
4.	1	19.4.2024	1	Unit IV: Introduction to JFET	4	Electronic Devices and Circuits - R.L. Boylestad
	2	22.4.2024 1.5.2024	2	Construction & operation of N-channel JFET, Construction & operation of P-channel JFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	3	2.5.2024	2	Differences between BJT & FET, Construction & operation of E-MOSFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	4	3.5.2024 4.5.2024	2	Construction & operation of D-MOSFET, V-I characteristics of D-MOSFET, E-MOSFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	5	6.5.2024	1	MOSFET as a capacitor	4 4	Electronic Devices and Circuits - R.L. Boylestad

Department of ECE

5	1	7.5.2024	1	Unit V: Special Purpose Devices	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	2	9.5.2024	2	Zener diode and its voltageregulator, Silicon controlled rectifier	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	3	10.5.2024	1	Tunnel diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	4	5.6.2024 6.6.2024	2	Unijunction Transistor, Photo diode and solar cell	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	5	7.6.2024	1	Varactor Diode and Light Emitting Diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	6	10.6.2024	1	Schottky Barrier Diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	7	12.6.2024	1	Revision	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE
LESSON PLAN (U-I)

Lesson No: 01, 02

Duration of Lessons: 3hr20 min

Lesson Title: Introduction to Electronic Devices

Instructional / Lesson Objectives:

- To make students understand course structure
- To familiarize students on different electronic components
- To understand students different types of materials.

Teaching AIDS:PPTs, Black board

Time Management of Class :200 minutes

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment – I & tutorial-I sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-I)

Lesson No: 03, 04

Duration of Lesson: 3 hr20 min

Lesson Title: PN junction as a Diode

Instructional / Lesson Objectives:

- To make students understand formation of PN junction diode
- To understand students different materials are used to form a Diode.

Teaching AIDS :PPTs, Black board

Time Management of Class :200 minutes

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment – I & tutorial-I sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-I)

Lesson No: 05, 06

Duration of Lesson: 2 hr30 min

Lesson Title: V-I characteristics of PN junction Diode

Instructional / Lesson Objectives:

- To familiarize students to draw the characteristics of a Diode
- To understand students the working of PN junction Diode.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min.

10 mins for taking attendance 20 for revision of previous class 100 min for lecture delivery 20 min for doubts session

Refer assignment – I & tutorial-I sheets

Signature of faculty

Department of ECE
LESSON PLAN (U-I)

Lesson No: 07,08

Duration of Lesson: 2hr30 min

Lesson Title: Diode Current Equation, Temperature effect of VI characteristics of Diode

Instructional / Lesson Objectives:

- To understand students to analyse Diode current equation
- To understand students to solve problems based on Diode equation
- To familiarize students to draw the temperature effect of vi characteristics of Diode.

To familiarize students

Teaching AIDS:PPTs, Black board

Time Management of Class : 150 min

5 mins for taking attendance 10 min for revision of previous class. 120 min for the lecture delivery 15 min for doubts session

Refer assignment – I & tutorial-I sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-I)

Lesson No: 09,10

Duration of Lesson: 1hr30 MIN

Lesson Title: blackbody radiation&Davisson – Germer experiment,

Instructional / Lesson Objectives:

- To make students understand the concept of black body radiation& dual nature of matter.
- To familiarize students on plank’s law, de Broglie hypothesis
- To understand students’limitations of classical physics and dual nature of matter
- To provide information on Davission - Germer experiment

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min.

5 mins for taking attendance
10 min for revision of previous class.
120 min for the lecture delivery
15 min for doubts session

Refer assignment-II & tutorial-II sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-I)

Lesson No: 11,12

Duration of Lesson: 1hr40 min.

Lesson Title: Heisenberg uncertainty principle(Qualitative), Born interpretation of the wave function,time independent Schrodinger wave equation.

Instructional / Lesson Objectives:

- To make students understand Heisenberg uncertainty principle and TISWE.
- To familiarize students on HUP and TISEW.
- To understand students the concept of uncertainty and probability density of wave functions.
- To provide information on wave functions and TISWE.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

10 mins for taking attendance 10 min for revision of previous class 70 min for the lecture delivery 10 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-I)

Lesson No: 13,14,15

Duration of Lesson: 1hr 40 min.

Lesson Title: particle in one dimensional potential box.

Instructional / Lesson Objectives:

- To make students understand potential in quantum mechanics
- To familiarize students on one dimensional box and its significance.
- To understand students the concept of wave functions, quantization of energy.
- To provide information on energy levels and probability of finding electron in particular region.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

10 mins for taking attendance 10 min for revision of previous class 70 min for the lecture delivery 10 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-II)

Lesson No: 06, 07,08

Duration of Lesson: 3 hr20 min

Lesson Title: free electron theory (Drude & Lorentz, Sommerfeld), Bloch's theorem, Kronig-Penney model (Qualitative),E-K diagram, effective mass of electron,

Instructional / Lesson Objectives:

- To make students understand the concept of free electron, periodic potential, effective mass
- To familiarize students on free electron theories and K-P model.
- To understand students the conduction of electrons in different materials.
- To provide information on solution for kronig-penny model and E-K diagram.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-II)

Lesson No: 09

Duration of Lesson: 50 min

Lesson Title: origin of energy bands, classification of solids.

Instructional / Lesson Objectives:

- To make students understand origin of energy bands and classification of solids.
- To familiarize students on conduction and valence bands, conductors, semiconductors and insulators.
- To understand students the concept fermi level, acceptor and donor levels
- To provide information on band structures of materials.

Teaching AIDS :PPTs, Black board

Time Management of Class : 50 min

5 mins for taking attendance
5 mins for previous lecture
30 min for the lecture delivery
10 min for doubts session

Refer assignment-II & tutorial-II sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-III)

Lesson No: 01,02

Duration of Lesson: 2hr30 min

Lesson Title: Intrinsic and extrinsic semiconductors, energy band diagrams, Hall effect

Instructional / Lesson Objectives:

- To make students understand Hall effect
- To familiarize students on direct and indirect bandgap semiconductors
- To understand students the concept of doping to form intrinsic and extrinsic semiconductors.
- To provide information on structure and applications of semiconductors

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 20 for revision of previous class 60 min for lecture delivery 10 min for doubts session
--

Refer assignment-III & tutorial-III sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-III)

Lesson No:04

Duration of Lesson: 50 min

Lesson Title: pn junction diode

Instructional / Lesson Objectives:

- To make students understand the concept of diodes and biasing.
- To familiarize students on formation and working of pn junctions
- To understand students the difference between forward and reverse bias.
- To provide information on I- V Characteristics and applications of pn junction diode

Teaching AIDS :PPTs, Black board

Time Management of Class : 50 min

5 mins for taking attendance 5 mins for previous lecture 30 min for the lecture delivery 10 min for doubts session

Refer assignment-III & tutorial-III sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-III)

Lesson No: 05,06

Duration of Lesson: 2hr30 min

Lesson Title: Zener diode, Bipolar junction transistor (BJT)

Instructional / Lesson Objectives:

- To make students understand difference between pn and zener diode.
- To familiarize students on functioning of n-p-n and p-n-p transistor.
- To understand students the concept of different working regions in BJT.
- To provide information on applications of diode and transistor.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

5 mins for taking attendance 10 min for revision of previous class. 120 min for the lecture delivery 15 min for doubts session

Refer assignment-III & tutorial-III sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-III)

Lesson No: 07,08

Duration of Lesson: 1hr 40 min

Lesson Title: LED and Photo diode

Instructional / Lesson Objectives:

- To make students understand construction and working of LED and photodiode.
- To familiarize students on I-V characteristics of LED and photodiode.
- To understand students the concept of electroluminescence and photovoltaic effect.
- To provide information on applications of LED and Photodiode.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 15 for revision of previous class 60 min for lecture delivery 15 min for doubts session
--

Refer assignment-III & tutorial-III sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-III)

Lesson No: 09

Duration of Lesson: 50 min

Lesson Title: Solar Cell

Instructional / Lesson Objectives:

- To make students understand the concept of photovoltaic effect and efficiency of solar cell'
- To familiarize students on construction and working of solar cell.
- To understand students the difference between solar cell and photodiode.
- To provide information on applications of solar cell.

Teaching AIDS :PPTs, Black board

Time Management of Class : 50 min.

5 mins for taking attendance 5 mins for previous lecture 30 min for the lecture delivery 10 min for doubts session

Refer assignment-III & tutorial-III sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-IV)

Lesson No: 01, 02

Duration of Lesson: 2 hr30 min

Lesson Title: Nano science and Bottom-up fabrication: sol-gel, combustion methods

Instructional / Lesson Objectives:

- To make students understand the synthesis methods of nanomaterials
- To familiarize students on nanoscale and significance of nanomaterials.
- To understand students the concept of quantum confinement, surface to volume ratio
- To provide information on sol-gel process and combustion methods.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

5 mins for taking attendance 10 min for revision of previous class. 120 min for the lecture delivery 15 min for doubts session

Refer assignment – IV& tutorial-IV sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-IV)

Lesson No: 03, 04

Duration of Lesson: 3 hr20 min

Lesson Title: Top-down fabrication: ball milling, Physical vapor deposition (PVD)

Instructional / Lesson Objectives:

- To make students understand top down and bottom-up methods.
- To familiarize students on ball milling and PVD
- To understand students the concept of milling and vapor deposition.
- To provide information on advantages, limitation and applications of the method.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment – IV & tutorial-IV sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-IV)

Lesson No: 05

Duration of Lesson: 1hr30 MIN

Lesson Title: Chemical vapor deposition (CVD)

Instructional / Lesson Objectives:

- To make students understand the concept of CVD
- To familiarize students on procedure to synthesize nanomaterials.
- To provide information on applications of CVD.

Teaching AIDS :PPTs, Black board

Time Management of Class : 50 min

5 mins for taking attendance 5 mins for previous lecture 30 min for the lecture delivery 10 min for doubts session

Refer assignment – IV & tutorial-IV sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-IV)

Lesson No: 06, 07

Duration of Lesson: 1 hr40 min

Lesson Title: Characterization techniques – XRD, SEM

Instructional / Lesson Objectives:

- To make students understand significance of characterization of nanomaterials.
- To familiarize students on characterization of nanomaterials using XRD and SEM
- To understand students the analysis of XRD and SEM diagrams of nanomaterials.
- To provide information on crystal structure analysis and morphological studies of nanomaterials.

Teaching AIDS : PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 15 for revision of previous class 60 min for lecture delivery 15 min for doubts session
--

Refer assignment – IV & tutorial-IV sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-IV)

Lesson No:08

Duration of Lesson: 50 min

Lesson Title: Transmission Electron Microscope (TEM), Applications of nanomaterials

Instructional / Lesson Objectives:

- To make students understand the construction and working of TEM
- To familiarize students on TEM image analysis
- To understand students the concept of single crystal, polycrystalline and amorphous
- To provide information on nanoparticle size distribution and defects in materials.

Teaching AIDS :PPTs, Black board

Time Management of Class : 50 min

5 mins for taking attendance 5 mins for previous lecture 30 min for the lecture delivery 10 min for doubts session

Refer assignment – IV & tutorial-IV sheets

Signature of faculty

Department of ECE

LESSON PLAN (U-V)

Lesson No: 01,02

Duration of Lessons: 3hr 20 min

Lesson Title: Interaction of radiation with matter& Einstein coefficients and their relations

Instructional / Lesson Objectives:

- To make students understand the concept of absorption and stimulated emission
- To familiarize students on interaction of matter with radiation.
- To provide information on Einstein coefficients and relations.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment- V& tutorial-V sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-V)

Lesson No: 03,04

Duration of Lesson: 1hr40 min

Lesson Title: Laser beam characteristics, Important components of laser-active medium, pumping source, optical Resonator, Construction and working principle- Nd:YAG laser, He-Ne laser

Instructional / Lesson Objectives:

- To make students understand working of laser
- To familiarize students on components of laser and its functioning
- To understand students the concept of population inversion and lasing action
- To provide information on Construction and working of Lasers.

Teaching AIDS : PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 15 for revision of previous class 60 min for lecture delivery 15 min for doubts session
--

Refer assignment- V & tutorial-V sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-V)

Lesson No: 05

Duration of Lesson: 1hr40 min

Lesson Title: semiconductor laser and applications of laser,

Instructional / Lesson Objectives:

- To make students understand working of semiconductor laser.
- To familiarize students on laser characteristics and applications
- To provide information on applications of lasers in different fields.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 15 for revision of previous class 60 min for lecture delivery 15 min for doubts session
--

Refer assignment- V & tutorial-V sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-V)

Lesson No: 06, 07

Duration of Lesson: 2hr30 min

Lesson Title: Introduction to optical fibers and classification

Instructional / Lesson Objectives:

- To make students understand the concept of total internal reflection, acceptance angle and numerical aperture.
- To familiarize students on construction and types of optical fibers.
- To understand students, step and graded index fibers.
- To provide information on advantages of optical fibers

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

5 mins for taking attendance 10 min for revision of previous class. 120 min for the lecture delivery 15 min for doubts session

Refer assignment- V & tutorial-V sheets.

Signature of faculty

Department of ECE

LESSON PLAN (U-V)

Lesson No: 08

Duration of Lesson: 1hr 40 min

Lesson Title: losses in optical fiber, optical fiber for communication system, applications of optical fiber.

Instructional / Lesson Objectives:

- To make students understand losses in optical fibers.
- To familiarize students on communication systems in optical fibers.
- To understand student applications of optical fibers

Teaching AIDS :PPTs, Black board

Time Management of Class :100 min

10 mins for taking attendance 15 for revision of previous class 60 min for lecture delivery 15 min for doubts session
--

Refer assignment- V & tutorial-V sheets.

Signature of faculty

Department of ECE

ASSIGNMENT – 1

This Assignment corresponds to Unit No. 1

Question No.	Question	Objective No.	Outcome No.
1	Explain the working of PN Junction diode and illustrate The characteristics in forward and reverse bias?	1	1
2	(A) Define reverse saturation current in PN junction Diode? (B) A Si diode has a reverse saturation current of $2.5\mu\text{A}$ at 300°K . Find forward voltage for a forward current of 10Ma .	1	1
3	Derive the expression for diffusion capacitance of a PN Junction diode?	1	1

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

ASSIGNMENT – 2

This Assignment corresponds to Unit No. 2

Question No.	Question	Objective No.	Outcome No.
1	Draw and explain Half wave Rectifier with the help of Waveforms and derive the following parameters. (i) V DC (ii) Efficiency (iii) Ripple factor (iv) TUF	2	2
2	Design a clipping circuit that clips at two independent Levels.	2	2
3	Explain the operation of positive clamping and Negative clamping circuits.	2	2

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE**ASSIGNMENT – 3**

This Assignment corresponds to Unit No. 3

Question No.	Question	Objective No.	Outcome No.
1	Explain the working of NPN and PNP transistors?	3	3
2	Draw and Explain the characteristics of Common Emitter Configuration?	3	3

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE**ASSIGNMENT – 4**

This Assignment corresponds to Unit No. 4

Question No.	Question	Objective No.	Outcome No.
1	i) Illustrate the working of N-channel JFET with its Characteristics? ii) Explain how FET acts as a Voltage Variable Resistor?	4	4
2	Explain the construction & working of P-channel Enhancement MOSFET with its characteristics?	4	4

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE**ASSIGNMENT – 5**

This Assignment corresponds to Unit No. 5

Question No.	Question	Objective No.	Outcome No.
1	Explain the construction of Zener diode and illustrate the Characteristics in forward bias and reverse bias?	5	5
2	Explain the operation of UJT and draw its characteristics?	5	5

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

TUTORIAL – 1

This tutorial corresponds to Unit No. 1 (Objective Nos.: 1, Outcome Nos.: 1)

Q1. What type of impurity ions is present in P-type semiconductor?

A) Donor ions B) Acceptor ions C) Both Donor and acceptor ions D) None of these

Q2. What is built-in potential value of Ge Diode?

A) 0.3v B) 0.1v C) 0.9v D) 0.7v

Q3. In forward bias condition, the rise in temperature how the characteristics of Si diode changes

A) Shift right B) shift left C) Constant D) none of these

Q4. In reverse bias condition, for every 10 degree centigrade rise in temperature, the reverse saturation current is

A) Doubled B) Tripled C) Constant D) None of these

Q5. How many valance electrons are present in semiconductor material?

A) =4 B) <4 C) >4 D) none of these

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

TUTORIAL – 2

This tutorial corresponds to Unit No. 2 (Objective Nos.: 2, Outcome Nos.: 2)

Q1. what is the efficiency of Center tapped full wave Rectifier

- A) 40.5% B) 81.2% C) 27.8% D) 121%

Q2. Clamper circuit is also referred as?

- A) DC cutter B) DC inserter C) DC lifter D) DC leveler

Q3. Which circuit is called the Limiter circuit?

- A) chopper circuit B) clipper circuit C) clamper circuit D) chopping circuit

Q4. Rectifier means

- A) AC to DC converter C) DC to AC converter
B) AC to Pulsating DC D) NONE OF THESE

Q5. How many Diodes used in Bridge Rectifier

- A) 1 B) 2 C) 3 D) 4

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

TUTORIAL SHEET – 3

This tutorial corresponds to Unit No. 3 (Objective Nos.: 3, Outcome Nos.: 3)

Q1. Which part of a transistor is heavily doped and emits majority carriers, either electrons or holes?

- A) Collector B) Emitter C) Base and Emitter D) Base

Q2. The number of depletion layers in a transistor is?

- A) 2 B) 3 C) 4 D) 5

Q3. Which among the following configuration has High current and Low voltage gain?

- A) CB B) CC C) CE D) None of these

Q4. BJT transistor consists of how many terminals?

- A) 3 B) 2 C) 1 D) 4

Q5. BJT stands for.....

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

TUTORIAL – 4

This tutorial corresponds to Unit No. 4 (Objective Nos.: 4, Outcome Nos.: 4)

Q1. What are the terminals of FET

A) Gate Drain Source C) Base Emitter Collector

B) Anode Cathode Gate D) Darian Base Source

Q2. FET Stands for-----

Q3. MOSFET STANDS FOR-----

Q4. _____ is a current control device

A) BJT B) FET C) MOSFET D) VDR

Q5. _____ is a voltage control device

A) BJT C) FET B) UJT D) PN

Signature of HOD

Date:

Signature of faculty

Date:

Department of ECE

TUTORIAL SHEET – 5

This tutorial corresponds to Unit No. 5 (Objective Nos.: 5, Outcome Nos.: 5)

Q1. SCR stands for.....

Q2. Solar cell can also be called as.....

Q3. Light Emitting Diode converts

A) Electrical to Light energy B) Light to Electrical energy

C) Electrical to mechanical energy D) None of these

Q4. Photo diode operates in

A) forward bias B) reverse bias

C) both forward and reverse D) none

Q5. What is the range of intrinsic standoff ratio in UJT

A) 0.5 to 0.75 B) 1 to 1.5 C) 2 to 5 D) above 5

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

EVALUATION STRATEGY

Target (s)

- a. Percentage of Pass : 85%

Assessment Method (s) (Maximum Marks for evaluation are defined in the Academic Regulations)

- a. Daily Attendance
- b. Assignments
- c. Online Quiz
- d. Continuous Internal Assessment
- e. Semester / End Examination

List out any new topic(s) or any innovation you would like to introduce in teaching the subjects in this semester

Case Study of any one existing application

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE**COURSE COMPLETION STATUS**

Actual Date of Completion & Remarks if any

Units	Remarks	Objective No. Achieved	Outcome No. Achieved
Unit 1	completed on 26.02.2024	1	1
Unit 2	completed on 19.03.2024	2	2
Unit 3	completed on 18.04.2024	3	3
Unit 4	completed on 06.05.2024	4	4
Unit 5	completed on 12.06.2024	5	5

Signature of HOD

Signature of faculty

Date:

Date:

Department of ECE

Mappings

1. Course Objectives-Course Outcomes Relationship Matrix

(Indicate the relationships by mark "X")

Course-Objectives \ Course-Outcomes	1	2	3	4	5
1	H				
2		H			
3			H		
4				H	
5					H

2. Course Outcomes-Program Outcomes (POs) & PSOs Relationship Matrix

(Indicate the relationships by mark "X")

P-Outcomes \ C-Outcomes	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO 1	PSO 2
1	H			M										
2	M	H	M											
3	H													
4	M	L	M	L										
5	H	L		M	M									

H-HIGH M-MODERATE L-LOW

Department of ECE

Rubric for Evaluation

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
	1	2	3	4
<i>Research & Gather Information</i>	Does not collect any information that relates to the topic	Collects very little information some relates to the topic	Collects some basic Information most relates to the topic	Collects a great deal of Information all relates to the topic
<i>Fulfill team role's duty</i>	Does not perform any duties of assigned team role.	Performs very little duties.	Performs nearly all duties.	Performs all duties of assigned team role.
<i>Share Equally</i>	Always relies on others to do the work.	Rarely does the assigned work - often needs reminding.	Usually does the assigned work - rarely needs reminding.	Always does the assigned work without having to be reminded
<i>Listen to other team mates</i>	Is always talking— never allows anyone else to speak.	Usually doing most of the talking-- rarely allows others to speak	Listens, but sometimes talks too much.	Listens and speaks a fair amount.

Department of ECE

EDC MID I & II PAPERS


Anurag
 ENGINEERING COLLEGE

 An Autonomous Institution
 (Approved by AICTE, New Delhi & Affiliated to JNTUH)

 Accredited with
NAAC
 NATIONAL ACADEMY OF
 ACCREDITATION COUNCIL
 ANANTHAGIRI (V&M), KODAD, SURYAPET (Dt.), TELANGANA - 508 206
 www.anug.ac.in *91 9553122270

I B.TECH II SEMESTER I MID EXAMINATIONS - APRIL 2024

Branch : B.Tech. (Common to All)

Max. Marks: 30

Date : 02 - Apr - 2024 AN

Time: 120 Minutes

Subject : Electronic Devices and Circuits, EC205ES

PART - A

ANSWER ALL QUESTIONS

10 X 1 M = 10 M

Q.No	Question		CO	BTL
1.	Write diode current equation	()	CO1	L2
2.	An ideal diode in forward-bias acts as (A). Buffer (B). Multiplier (C). Closed switch (D). Open switch	()	CO1	L1
3.	VI characteristics of pn junction diode is (A). Linear (B). non linear (C). decreasing (D). none of the above	()	CO1	L2
4.	Define reverse saturation current of PN junction diode	()	CO1	L2
5.	Define efficiency and what is the efficiency of halfwave and fullwave rectifier	()	CO2	L1
6.	Define clipper	()	CO2	L1
7.	Define Rectifier	()	CO2	L1
8.	what do you meant by clamper	()	CO2	L1
9.	What is the increasing order for size of BJT terminals (A). base<emitter<collector (B). collector<emitter<base (C). base<collector<emitter (D). none of the above	()	CO3	L2
10.	What is the order of doping concentration for regions of BJT (A). base>emitter>collector (B). emitter>base>collector (C). base<collector<emitter (D). none of the above	()	CO3	L2

PART - B

ANSWER ANY FOUR

4 X 5 M = 20 M

Q.No	Question		CO	BTL
11.	With neat diagram explain the working of pn junction diode in forward bias and reverse bias with volt-ampere characteristics		CO1	L2
12.	Explain volt-ampere characteristics of pn junction diode and show the effect of temperature on it		CO1	L2
13.	Explain the working of bridge rectifier with the help of waveforms and also derive its efficiency		CO2	L2
14.	Explain the working of halfwave rectifier with the help of waveforms and also derive its ripple factor		CO2	L2
15.	Explain the operation of PNP Transistor		CO3	L2
16.	With neat diagram explain the input-output characteristics of BJT for CB configuration		CO3	L3

Department of ECE



I B.TECH II SEMESTER II MID EXAMINATIONS - JUNE 2024

Branch : B.Tech. COMMON TO ALL

Date : 19-Jun-2024 Session : Afternoon

Subject : Electronic Devices and Circuits, EC205ES

Max. Marks : 30M

Time : 120 Min

PART - A

ANSWER ALL THE QUESTIONS

10 X 1M = 10M

Q.No	Question	CO	BTL
1.	What are the application of transistors.	CO3	L1
2.	What is saturaion and cut off region.	CO3	L1
3.	MOSFET stands for _____	CO4	L1
4.	Write relation between FET parameters.	CO4	L1
5.	FET is _____ Variable resistor (A). Current (B). Voltage (C). Power (D). Channel	CO4	L1
6.	Draw Symbol of N-channel JFET	CO4	L1
7.	Draw symbol of UJT.	CO5	L1
8.	Draw Characteristics of Solar Cell	CO5	L1
9.	Draw symbol of LED.	CO5	L1
10.	What are the applications of Photo Diode.	CO5	L1

PART - B

ANSWER ANY FOUR

4 X 5M = 20M

Q.No	Question	CO	BTL
11.	Draw and explain input and output characteristics of of BJT CE configuration.	CO3	L3
12.	Explain Transistor switching characteristics in detail.	CO3	L4
13.	Explain construction , working and V-I Characteristics of N-channel Depletion MOSFET.	CO4	L3
14.	Compare BJT and FET.	CO4	L3
15.	Explain operation, V-I Characteristics of UJT.	CO5	L3
16.	Explain operation, V-I Characteristics of Varactor Diode.	CO5	L3

Department of ECE

Internal Marks (ECE)

Continuous Internal Assessment (R-22)

Programme: **B.Tech. (ECE)**Year: **I**Course: **Theory**A.Y: **2023-24**Course: **EDC** Section: **A&B**Faculty Name: **Mr.L.HARI PRASAD**

S. No	Roll No	MID-I (30M)	MID-II (30M)	Avg. of MID I & II(30M)	Avg. of assignment I & II(5M)	Viva- Voce/Poster Presentation (5M)	Total Marks (40)
1	22C11A0406	2	7	5	5	5	15
2	22C11A0412	6	15	11	3	5	19
3	23C11A0401	18	16	17	5	5	27
4	23C11A0402	21	16	19	5	5	29
5	23C11A0403	10	18	14	5	5	24
6	23C11A0404	21	29	25	5	5	35
7	23C11A0405	10	13	12	5	5	22
8	23C11A0406	14	9	12	5	5	22
9	23C11A0407	12	16	14	5	5	24
10	23C11A0408	13	16	15	5	5	25
11	23C11A0409	10	14	12	5	5	22
12	23C11A0410	9	11	10	5	5	20
13	23C11A0411	8	17	13	5	5	23
14	23C11A0412	8	10	9	5	5	19
15	23C11A0413	18	23	21	5	5	31
16	23C11A0414	17	6	12	5	5	22
17	23C11A0415	12	13	13	5	5	23
18	23C11A0416	5	4	5	5	5	15

Department of ECE

19	23C11A0417	17	23	20	5	5	30
20	23C11A0418	1	7	4	5	5	14
21	23C11A0419	11	19	15	5	5	25
22	23C11A0420	25	27	26	5	5	36
23	23C11A0421	11	7	9	5	5	19
24	23C11A0422	4	3	4	5	5	14
25	23C11A0423	4	5	5	5	5	15
26	23C11A0424	17	26	22	5	5	32
27	23C11A0425	22	24	23	5	5	33
28	23C11A0426	14	13	14	5	5	24
29	23C11A0427	16	22	19	5	5	29
30	23C11A0428	14	20	17	5	5	27
31	23C11A0429	12	12	12	5	5	22
32	23C11A0430	17	12	15	5	5	25
33	23C11A0431	24	24	24	5	5	34
34	23C11A0432	1	15	8	5	5	18
35	23C11A0433	9	13	11	5	5	21
36	23C11A0434	4	9	7	5	5	17
37	23C11A0435	5	18	12	5	5	22
38	23C11A0436	20	15	18	5	5	28
39	23C11A0437	22	10	16	5	5	26
40	23C11A0438	9	10	10	5	5	20
41	23C11A0439	25	23	24	5	5	34
42	23C11A0440	16	12	14	5	5	24
43	23C11A0441	19	23	21	5	5	31
44	23C11A0442	16	16	16	5	5	26

Department of ECE

45	23C11A0443	2	12	7	5	5	17
46	23C11A0444	3	14	9	5	5	19
47	23C11A0445	9	10	10	5	5	20
48	23C11A0446	20	21	21	5	5	31
49	23C11A0447	14	13	14	5	5	24
50	23C11A0448	18	16	17	5	5	27
51	23C11A0449	1	AB	1	3	AB	4
52	23C11A0450	30	24	27	5	5	37
53	23C11A0451	28	17	23	5	5	33
54	23C11A0452	14	19	17	5	5	27
55	23C11A0453	22	18	20	5	5	30
56	23C11A0454	10	11	11	5	5	21
57	23C11A0455	29	30	30	5	5	40
58	23C11A0456	16	18	17	5	5	27
59	23C11A0457	25	29	27	5	5	37

No. of Absentees: MID-I: 00 , MID-II: 02

Total Strength: 59

Signature of Faculty

:

Signature of HoD

Department of ECE
Sample Answer scripts and Assignments Link

<https://drive.google.com/file/d/1iV9e5hPmD9CWVYvqXITWjZvOnuZDkxng/view?usp=sharing>

<https://drive.google.com/file/d/1Dz7iSsTOrYgHmaCnuHINCw9qUXKcRzj/view?usp=sharing>

Department of ECE
EDC Material Link

https://docs.google.com/presentation/d/1FlzXAV_y6WQedeFmXhw_oN6HNENwnxZDX/edit?usp=sharing&oid=117962187718651727112&rtpof=true&sd=true

https://drive.google.com/file/d/1gEA_8HwZbxE9GD3S9IC1wwPtCBx1nlfy/view?usp=sharing

https://drive.google.com/file/d/1bHUwwxgtsFVxOxWF_sN6Gpx0ttU4tOqa/view?usp=sharing

<https://drive.google.com/file/d/1BJ9A7qNcY4IO2ynhz2D1vyxN5-fe-53/view?usp=sharing>

<https://drive.google.com/file/d/1Kys7IFB2VHpLKrQ3FJhW7erOcmkwJpQT/view?usp=sharing>

https://drive.google.com/file/d/1oST5IQEwPV4xtpBwzFbg_ERpwpwimt0g/view?usp=sharing