

Stanley College of Engineering & Technology for Women(A)

B.E -III Sem Mid-I Question wise marks list- CO PO Mapping for the A.Y-2022-23

Branch : ECE

Section : 1

Sub : Electronic Devices and Circuits

Date(Mid-I): 28/10/2022

Date(Mid-II) : 13/12/2022

Date(Mid-III) :27/12/2022

ROLL NO	MID I									MID II									MID III												
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	TOT AL	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	TOT AL	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	TOT AL	
160621735001	0	0	0	3	0	2			5	AB											0	1		1	2	2		3	3	12	
160621735002	0	2	2	2	2	5		5	23	1	2	2	2	1		5	3	4	20												
160621735003	1	2	2	0		3	1	2	11	0	0	1	2					2	5	2			1	2	3	1		0		9	
160621735004		2			4	4			10									1	1												
160621735006	1	2	2	1		5	2	1	14	0	0	1	1	1		2	1	3	9												
160621735007	1	2	0	0	1	3	0	2	9	1	2	0	0	0		2	2	2	9												
160621735008	2	2		1	4	5		5	19	0	0	1	1		4	4	5	15													
160621735009	2				3	3			10	1		1	1	0					3	2	2	1	1	2						8	
160621735010		1		0	4	3		4	12				0	0		3		4	7	1	2	0	0	2	2				2	9	
160621735011	0	2	2		2		5	4	20	1	2	1	2	2		5	5	5	23												
160621735012	0	1	0	0	0	2	0	0	3	0	0	0	0	0				0	0												
160621735013					4	3			7	0	0	0	0	0	0				0	0	1	0	0	1	2	0		0		4	
160621735014	1		2	0	0	2	2	2	11	0	0	0	1	1		1	0	2	5												
160621735015	0	2	2	0	1	5	4		2	16	1	1	0	0	0		0	2	4	8											
160621735016		2	2			5	4	3	16	0	0	0				2	0	4	6												
160621735017	1	2	1	0	0	5		4	4	18	1	1	0	0	1		5	4	4	16											
160621735018	2	2	2	0	2	3	5	2	18	1	2	1	2	2	2	4		3	17												
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160621735020	0	2	2	0		5	3	2	14		2	0				4	4		10												
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160621735023		0			4	0			4	1	2	0	0	0		1	5	0	9	0	2	1	0	2	2	1		0		8	
160621735024	2	2	2	0	2	5	4	4	21	1	2	2	0	0		5	5	4	19												
160621735025	1	0	2	0	0	3	2	0	8	0									0	2	2	1		2	0	0	0	3		10	
160621735026	2	2		1	5	3	4		17	1	2	2	2	0	5	5	5		22												
160621735027	1	2	1	1	0	5	5	3	18	1	2	1	1	1		5	3	5	19												
160621735028	2	2	1	0	3	2		1	11	0	0	0	0	0	0	0	0		0												
160621735029	2	2		1	4	1			10							0	0	3	3	1	0	2	1	1	2	3		4		14	
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160621735035		2	2			4			8	1	1	1						3	6												
160621735036	0	2	2	0	0	3	0		7	0	0	0	0	0	0	0		4	4												
160621735037	2	2	2	2	2	5	5	2	22		2	2	2	1	2	5	4		18												
160621735038	2	2	2	2	2	3	5	5	23	1		1	1	1	4	3	0	3	14												
160621735039	2	1	2	2	2	5	3		17	2	1	2		0	2	4		4	15												
160621735040	1		0		5	2	2		10	2	2		1			2	2	2	11		2	1	0	2	3	4		0		12	

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

LESSON PLAN

Electronic Devices and Circuits (SPC311EC)

Academic Year: 2022-2023

Class: B.E. (ECE) Sem: III

Semester End Examination (SEE): 60 Marks
Continuous Internal Evaluation (CIE): 40 Marks
No. of Instruction Periods (per week): 04

Name, Designation & Dept. of the Instructor: Mrs. T. Prassanna, Assistant Professor, Dept. of ECE

Course Purpose: Electronics Devices is a basic course which deals with construction, operation and characteristics of the devices. All the circuits are built with devices and application include Industrial, communications, embedded systems and VLSI fields.

Course Structure: This course comprises of five units.

Unit-1: Deals with semiconductor physics and semiconductor diode formation & biasing. Breakdown Mechanisms.

Unit-2: Deals with rectifier performance parameters & design of rectifiers and filters.

Unit-3: Deals with transistor formation, current components, biasing techniques and stabilization techniques.

Unit-4: Analysis of amplifier circuits for current gain, voltage gain, input impedance & output impedance with exact and approximate model.

Unit-5: Deals with JFET & MOSFET construction & operation. Amplifiers using FETs.

COURSE SCHEDULE

Class Hour	Week No.	Topics to be covered	Pedagogy (Online/Offline)	Text/Reference Book (s)
1	1	Basics of Semiconductors: Review of Quantum mechanics electronics in periodic lattices ,	Offline	<u>Jacob Millman, Christos C. Halkias, and Satyabrata Jit. Electronic Devices and Circuits, 3rd edition, McGrawHill education, 2010</u>
2		E-K diagram, Energy bands in intrinsic and extrinsic Silicon.		
3		Carrier transport: diffusion current ,drift current, mobility and resistivity ;		
4		Generation and recombination of carriers.		
5	2	Poisson and	Offline	<u>Jacob Millman, Christos C. Halkias, and Satyabrata Jit. Electronic Devices and Circuits, 3rd edition, McGrawHill education, 2010</u>
6		continuity equation		
7		Junction Diode : PN Junction formation ,Characteristics, biasing- band diagrams and current flow		
8		Diode current equation		

9	3	Breakdown in diodes.	Offline	
10		Diode as a circuit element		
11		small signal diode models, Diode switching characteristics		
12		Zener Diodes		
13	4	Zener voltage regulator	Offline	S Salivahanan, N Kumar, A Vallavaraj; <i>Electronic Devices and Circuits</i> , Tata McGraw Hill, 4 th edition, 2008.
14		Tutorial-1		
15		PN Diode Applications: Power supply block diagram		
16	5	Half wave, operation, performance characteristics, and analysis;	Offline	
17		Full wave and operation, performance characteristics, and analysis		
18	6	Bridge rectifiers - their operation, performance characteristics, and analysis	Offline	
19		Filters -L		
20		Filters -C		
21	7	Filters -LC and CLC	Offline	Jacob Millman, Christos C.Halkias, and Satyabrata Jit, <i>Electronic Devices and Circuits</i> , 3 rd edition, McGrawHill education, 2010
22		Comparison of filters		
23		design of Rectifiers with Filters		
24	8	design of Rectifiers without Filters	Offline	Jacob Millman, Christos C.Halkias, and Satyabrata Jit, <i>Electronic Devices and Circuits</i> , 3 rd edition, McGrawHill education, 2010
25		Tutorial-2		
26		Bipolar Junction Transistor : Transistor Junction formation		
27		Transistor biasing-band diagram for NPN and PNP transistors		
28	9	current components and current flow in BJT,	Offline	S Salivahanan, N Kumar, A Vallavaraj; <i>Electronic Devices and Circuits</i> , Tata McGraw Hill, 4 th edition, 2008.
29		Modes of transistor operation,		
30		BJT V-I characteristics in CB, Early effect		
31	10	CE configuration	Offline	
32		CC, BJT as an amplifier, BJT biasing techniques, Self bias		
33	11	Fixed and collector to base bias	Offline	
34		operating point stabilization		
35	12	against temperature and device variations	Offline	Christos C.Halkias, and Satyabrata Jit, <i>Electronic Devices</i>
36		Bias stabilization and		

35		compensation techniques.		
36		Tutorial-3		
37	9	Small Signal Transistors	Offline	and Circuits, 3 rd edition, McGrawHill education, 2010 Robert Eoytstad and Louis Nasbelsky, Electronic Devices and Circuit Theory, 11 th ed, Pearson India publications, 2015
38		equivalent circuits : Small signal low frequency h-parameter model of BJT,		
		Small signal low frequency h-parameter model of BJT,		
39		Exact model, analysis of BJT amplifiers using approximate model for CE.		
40		Exact model, analysis of BJT		
41	11	amplifiers using approximate model for CB and CC.	Offline	
42		Approximate model, analysis of BJT amplifiers using approximate model for CB, CE and		
43		CC configurations,		
44		Comparison of amplifiers		
		Junction Field Effect Transistors (JFET): JFET formation, operation & current flow		
45	12	V-I characteristics of JFET, Transconductance and drain current.	Offline	
46		Low frequency small signal model of FETs. Analysis of CS amplifier		
47		Tutorial-4		
48		MOSFETs: Enhancement & Depletion mode MOSFETs, Current equation, V-I characteristics		
49	13	Depletion mode MOSFETs, Current equation, V-I characteristics	Offline	
50		MOS capacitor, MOSFET Applications		
51		SCR VI characteristics.		
52		Tutorial -5		

Register to get Certification From IETE Pune Chapter.

SENSORS & ACTUATORS IN CONTEXT AI ML IOT

Dr. K. Padmavathi
Assoc. Prof, ECE department
SCETW, Hyderabad.



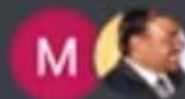
Arjun Ghule



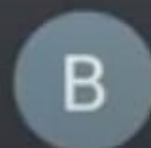
Katakam Padmavathi



Harshdeep Trehan

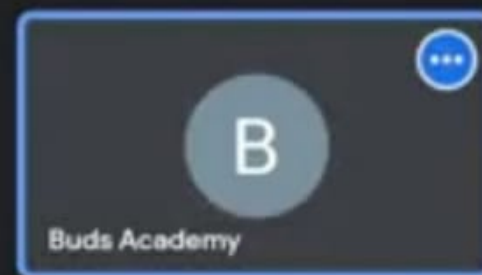
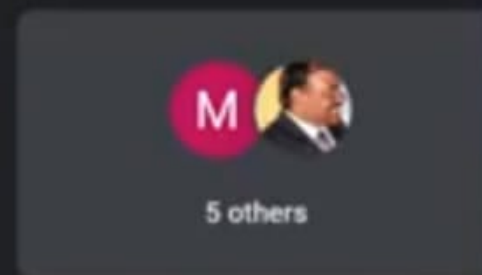
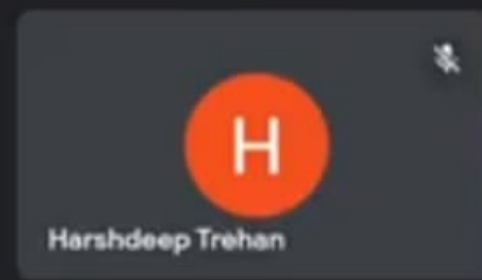


6 others

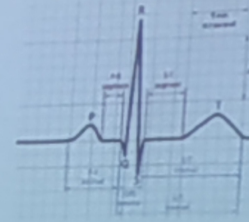


Buds Academy

Register to get Certification From IETE Pune Chapter.



Measuring of heart beat using ECG

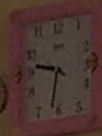


- **P-wave:**

- It is a small upward wave that appears first
- It indicates atrial depolarization (systole), during which excitation spreads from SA node to all over atrium
- About 0.1 second after P-wave begins, atria contracts. Hence P-wave represents atrial systole

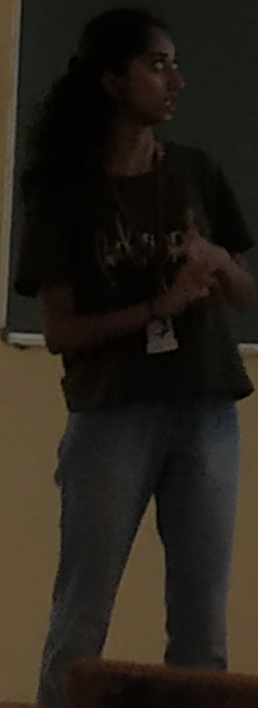
- **QRS wave:**

- It is the second wave that begins as a little downward wave but continues as a large upright triangular wave and ends as downward wave
- It represents the ventricular depolarization (systole)
- Just after QRS wave begins, ventricles starts to contracts. Hence QRS wave represents ventricular systole

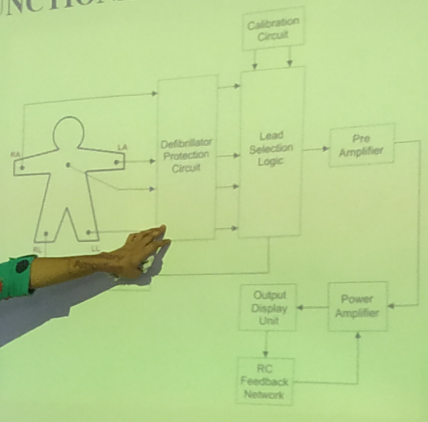


Advantages of ECG

- ECG is helpful to measure three basic parameters of clinical interest viz. rhythm and heart rate, axis of the heart and state of myocardial muscle.
- ECG represents data in the topographic form which provides higher diagnostic information.
- ECG helps to prevent heart attacks by analyzing heart parameters at the initial stage.
- ECG is used to detect the cardiac conditions of the patients after surgical or any other operation and after application of anesthesia.
- ECG test is quick, painless and safe.
- ECG test is cheap in cost.

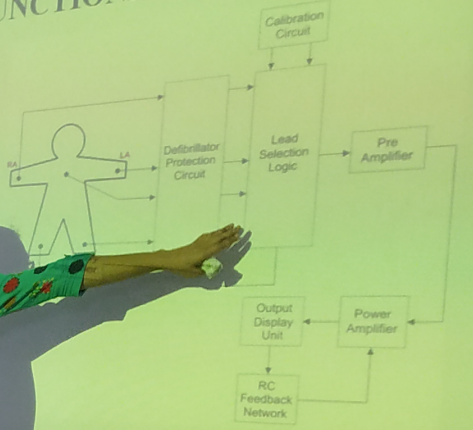


FUNCTIONAL BLOCK DIAGRAM



REDMI NOTE 5 PRO
MI DUAL CAMERA

FUNCTIONAL BLOCK DIAGRAM





REDMI NOTE 5 PRO
MI DUAL CAMERA



REDMI NOTE 5 PRO
MI DUAL CAMERA

UNIT 5

TOPIC 2 - EEG

ELECTROENCEPHALOGRAPHY

By

G.Jayaraj-160619735014

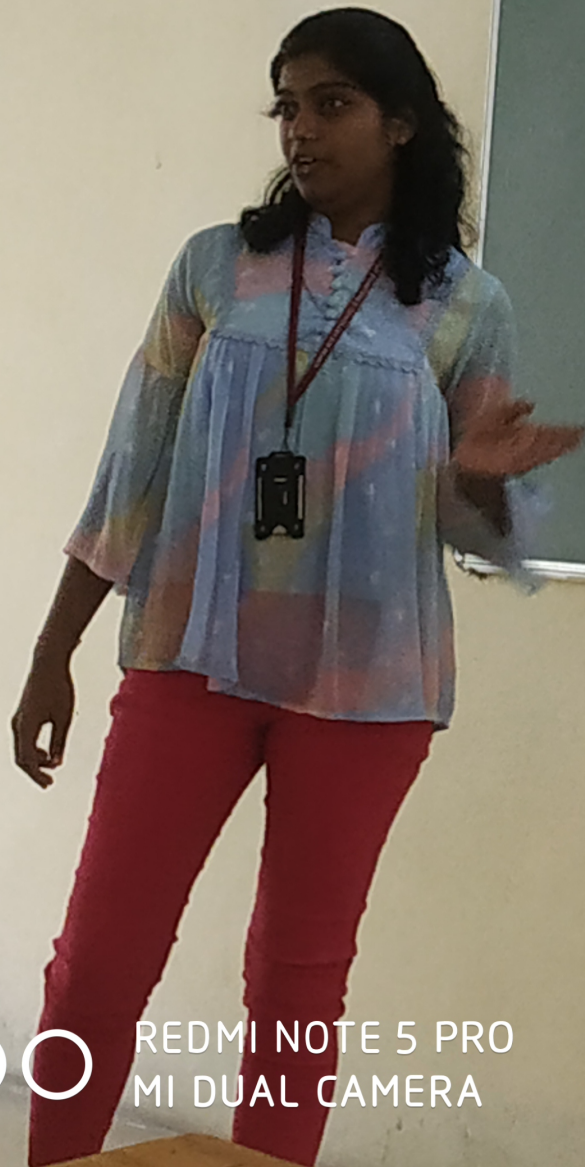
S.Srikari-160619735040

V.Ramya-160619735046

Faculty:

UDAYINI CHANDRAN

Asst. Professor,



Emotional & motor control

- Parietal lobes:

Sensory purpose (pain, touch, pressure)

- Temporal lobes:

Auditory system (hear & sound).

- Occipital lobes:

Visual purpose (see & eye).

COURSE INFORMATION SHEET

COURSE NAME: ELECTRONIC DEVICES AND CIRCUITS COURSE CODE: SPC301EC REGULATION: 2021-2
 PROGRAM / YEAR / SEMESTER: BE / III SEM CREDITS: 3 AY : 2022-

COURSE TYPE: CORE CONTACT HOURS: 3+1 (Tutorial) hours/Week.
 COURSE AREA/DOMAIN: VLSI CORRESPONDING LAB COURSE NAME, CODE (IF ANY): Electronic Devices (SPC 311EC)
 PRE-REQUISITE COURSES/SEM/CODE (IF ANY) : ---

SYLLABUS:

UNIT	DETAILS	HOURS (LECTURE)	HC (TUT)
I	Basics of Semiconductors: Review of semiconductors and their properties, Poisson and continuity equations, Hall Effect, Fermi level in N-type and P-type semiconductors. Junction Diode: PN Junction formation, Characteristics, biasing-band diagram and current flow, Diode current equation, Diode as a circuit element, Small signal diode models, Diode switching characteristics, effect of temperature on diode Characteristics, Breakdown mechanisms in diodes, Zener Diode, Zener voltage regulator.	12	
II	PN Diode Applications: Half wave, Full wave and Bridge rectifiers - their operation, performance characteristics, and analysis; Filters L,C,LC and CLC filters, used in power supplies wit FWR and their ripple factor calculations, design of Rectifiers with and without Filters. Specials Diodes: Elementary treatment on the functioning of Light Emitting Diode, Photo diodes and solar cells.	10	
III	Bipolar Junction Transistor: Transistor Junction formation, Transistor biasing – band diagram for NPN and PNP transistors, current components and current flow in BJT, Early Effect, BJT V-I characteristics in CB, CE, CC configurations, BJT biasing techniques, operating point stabilization against temperature and device variations, Bias stabilization and compensation techniques.	10	
IV	Small Signal Transistors equivalent circuits: Small signal low frequency h-parameter model of BJT. Analysis of BJT amplifiers using exact and approximate model for CB, CE and CC configurations. Comparison of amplifier configurations.	7	
V	Junction Field Effect Transistors (JFET): JFET formation, operation & current flow, V-I characteristics of JFET, Low frequency small signal model of FETs, Analysis of CS amplifiers. MOSFETs: Enhancement & Depletion mode MOSFETs, current equation, V-I characteristics, MOS capacitor, MOSFET applications, SCR V-I Characteristics.	8	
TOTAL		47	

TEXT/REFERENCE/ADDITIONAL BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLISHER
T1	Jacob Millman, Christos C.Halkias, and Satyabrata Jit, <i>Electronic Devices and Circuits</i> , 3 rd edition, McGrawHill education.
T2	Robert Boylestad and Louis Nashelsky, <i>Electronic Devices and Circuit Theory</i> , 11 th ed, Pearson India publications, 2015
T3	B.G. Stretman and S.K. Banerjee, <i>Solid State Electronic Devices</i> , 7 th edition, Pearson, 2014
R1	D. Neamen, D. Biswas, <i>Semiconductor physics and Devices</i> , McGraw –Hill education
R2	S.M. Sze and K.N. Kwok, <i>Physics of semiconductor devices</i> , 3 rd edition, John Wiley 7 sons, 2006
R3	S Salivahanan, N Kumar, A Vallavaraj; <i>Electronic Devices and Circuits</i> , Tata McGraw Hill, 4 th edition, 2008.

WEB SOURCE REFERENCES: (Detailed Topic link)

- W1 http://site.iugaza.edu.ps/mahir/files/2013/02/B-stad_CH_01.ppt
- W2 https://www.utdallas.edu/~ee3310_classnotes_f02_1.pdf

COURSE OUTCOMES:

SNO	DESCRIPTION	PO(I..12) MAPPING	PSO(MAPE)
SPC301EC.1	Interpret the characteristics of diodes using models for analysis of various applications. (BLT 4 &5)	1,2,3,4,6,8,9, 12	PSO1, PS
SPC301EC.2	Compare performance characteristics of various filters. (BLT 5).	1,2,3,4,6,7,8,9,12	PSO1,PS
SPC301EC.3	Discriminate the BJT configurations and design a stable biasing circuit. (BLT 4 & 6)	1,2,3,4, 6,7,9, 12	PSO1,PS
SPC301EC.4	Analyse and design BJT amplifiers. (BLT 4)	1,2,3, 4, 6, 8,9,12	PSO1,PS
SPC301EC.5	Distinguish the operations of FETs & MOSFETs.(BLT 4)	1,2,3,4, 6,8,9,12	PSO1,PS

COURSE OUTCOMES VS POS MAPPING (DETAILED: HIGH:3, MEDIUM:2, LOW:1):

SNO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO
SPC301EC.1	2	3	3	3	2	3	-	2	3	-	-	3	-
SPC301EC.2	2	3	3	2	1	2	2	1	3	-	-	2	-
SPC301EC.3	2	3	3	3	2	2	-	1	3	-	-	3	-
SPC301EC.4	3	2	3	3	2	2	-	1	3	-	-	3	-
SPC301EC.5	3	3	2	2	1	2	-	1	3	-	-	2.40	1.4
AVG	2.40	2.80	2.80	2.60	1.60	2.20	2.00	1.00	3.00	-	-	-	-

* For Entire Course, PO & PSO Mapping
 Note: Enter correlation levels 1, 2 or 3 as defined below: 1: Slight (Low) (High) If there is no correlation, put "-"

2: Moderate (Medium) 3: Substantial

POs & PSO REFERENCE:

- | | | |
|---------------------------|----------------------------------|---|
| PO1 Engineering Knowledge | PO6 Engineer & Society | PO11 Project Mgt. & Finance |
| PO2 Problem Analysis | PO7 Environment & Sustainability | PO12 Life Long Learning |
| PO3 Design & Development | PO8 Ethics | PSO1 Appertain to Communication Automation Principles |
| PO4 Investigations | PO9 Individual & Team Work | PSO2 Adaptability to Productive Envi |
| PO5 Modern Tools | PO10 Communication Skills | |

GAPS IN THE SYLLABUS - TO MEET COs, POs & PSOs:

SNO	GAP	PROPOSED ACTIONS	PROPOSED RESOURCE	CO	PO
-----	-----	------------------	-------------------	----	----

TOPICS BEYOND SYLLABUS: Additional course material / learning material / Lab Experiments / Projects		CO	PO / PSO
S.No	Description	SPC301EC.3	1,2,3,4,6,7,9,12 / 1,2
1.	UJT construction and characteristics		

Web Link of the Course Material: Google Classroom, Big Blue Button and Moodle

Innovation / Pedagogical Initiatives to cater Weak & Advanced Learners:

Weak: Classes conducted before the commencement of coursework to brush up the basics (based on the results in the previous semester) Advanced: Designing of circuits as mini projects

INSTRUCTIONAL METHODOLOGIES:


- | | | | |
|---|---|---|--|
| <input checked="" type="checkbox"/> REAL WORLD EXAMPLES | <input type="checkbox"/> COLLABORATIVE LEARNING | <input checked="" type="checkbox"/> QUALITY LAB EXPERIMENTS | <input type="checkbox"/> OBSERVATIONS RECORDED |
| <input type="checkbox"/> INDUSTRY INTERNSHIP | <input type="checkbox"/> SUMMER TRAINING | <input checked="" type="checkbox"/> EXPERT GUEST LECTURES | <input checked="" type="checkbox"/> PROJECTS |
| <input checked="" type="checkbox"/> USE OF ICT | <input type="checkbox"/> ANY OTHER (SPECIFY) | | |

ASSESSMENT METHODOLOGIES-DIRECT

- | | | | |
|--|--|---|--|
| <input checked="" type="checkbox"/> EXAM QUESTIONS | <input checked="" type="checkbox"/> TUTORIAL QUESTIONS | <input checked="" type="checkbox"/> ASSIGNMENTS | <input checked="" type="checkbox"/> LABORATORY PROJECT PRESENTATIONS |
| <input type="checkbox"/> PROJECT EVALUATION | <input type="checkbox"/> STUDENT ARTIFACTS | <input checked="" type="checkbox"/> ORAL EXAMS | |
| <input checked="" type="checkbox"/> INTERNALLY DEVELOPED EXAMS | <input type="checkbox"/> ANY OTHER (SPECIFY) | | |

ASSESSMENT METHODOLOGIES-INDIRECT

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> STUDENT EXIT SURVEY | <input checked="" type="checkbox"/> CO-CURRICULAR ACTIVITIES | <input type="checkbox"/> EXTRA CURRICULAR ACTIVITIES |
|---|--|--|


 Prepared by
 T. Prasanna


 Approved by
 (HOD, ECE)

STANLEYLMS

Attendance for the course :: S&S-A 21-25

Sessions Add session Report Export Status set Temporary users

Aug 28 - Sep 3

All All past Months Weeks Days

#	Date	Time	Type	Description	Actions
1	Mon 28 Aug 2023	12PM - 1PM	All students	Regular class session	▶ ⚙️ 🗑️ <input type="checkbox"/>
2	Mon 28 Aug 2023	12PM - 1PM	All students	Regular class session	▶ ⚙️ 🗑️ <input type="checkbox"/>
3	Thu 31 Aug 2023	12PM - 1PM	All students	Regular class session	▶ ⚙️ 🗑️ <input type="checkbox"/>
4	Thu 31 Aug 2023	12PM - 1PM	All students	Regular class session	▶ ⚙️ 🗑️ <input type="checkbox"/>

Choose... OK

Announcements

Jump to...

Continuous Assessment upload ▶

- S&S-A
- Participants
- Badges
- Competencies
- Grades
- General**
- Topic 1
- Topic 2
- Topic 3
- Topic 4
- Dashboard

- STANLEYLMS
- S&S-A
- Participants
- Badges
- Competencies
- Grades
- General
- Topic 1
- Topic 2
- Topic 3
- Topic 4
- Dashboard

Topic 2

- CIS
- Lesson Plan
- PO Justification

Topic 3

- ASSIGNMENT-1
- ASSIGNMENT-2
- Assignment - 3
- Assignemt - 4
- MID-1 important questions

Topic 4