MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

Affiliated to Periyar University, Salem | Accredited by **NAAC** with 'A' Grade

Recognized by **UGC** under Section 2(f) & 12 (B)

MUTHAYAMMAL
COLLEGE OF ARTS
AND SCIENCE
(Autonomous)
A UNIT OF **VANETRA** GROUP

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DEGREE OF BACHELOR OF SCIENCE

Learning Outcomes – Based Curriculum Framework – Choice Based Credit System

Syllabus for B.Sc., Electronics and Communication (Semester Pattern)

(For Candidates admitted from the academic year 2021 –2022 and onwards)

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

RASIPURAM - 637408

VISION

❖ To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, thereby nurturing a generation of committed, Knowledgeable and socially responsible citizens.

MISSION

❖ To Ensure State of the world learning experience

❖ To espouse value based Education

❖ To empower rural education

❖ To instill the sprite of entrepreneurship and enterprise

❖ To create a resource pool of socially responsible world citizens

QUALITY POLICY

To seek – To strive – To achieve greater heights in Arts & Science, Engineering, Technological and Management Education without compromising on the quality of education.

Vision:

To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, thereby nurturing a generation of committed, Knowledgeable and socially responsible citizens.

Mission:

- ✓ To Ensure State of the world learning experience
- ✓ To espouse value based Education
- ✓ To empower rural education
- ✓ To instill the sprite of entrepreneurship and enterprise
- ✓ To create a resource pool of socially responsible world citizens

PROGRAMME EDUCATIONAL OBJECTIVES (PEO):

PEO1: Graduates will be able to promote learning environment to meet the industry expectation.

PEO2: Graduates will be incorporated the critical thinking with good Communication and Leadership skills to become a self-employed

PEO3: Graduates will be upholding the human values and environmental sustenance for the betterment of the society.

The Graduate Attributes of B.Sc Electronics and Communication are:

GA 1 Analytical Reasoning

GA 2 Critical Thinking

GA 3 Problem Solving Skills

GA 4 Communication Skills

GA 5 Leadership Quality

GA 6 Team work

GA 7 Lifelong Learning

PROGRAMME OUTCOMES (POs):

PO1: Graduates will acquire dynamic skills through proper perception of the course objectives that leads to scientific and analytical comprehension of the concepts.

PO2: Graduates will focus on sustainable goals that might bring about spherical developments.

PO3: Graduates will infuse a spirit converging on bricking a team work, interpersonal and administrative skills to think critically and execute effectively

PO4: Graduates will apply reasoning appropriately to scale the humps in learning and solute them to the core.

PO5: Graduates will engage the skills obtained in independent and collaborative learning as a perennial process.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1: Apply proficiency in use of software and hardware required to practice electronics and communication profession.

PSO2: Graduates will be able to apply fundamentals of electronics in various aspects of analog and digital systems.

PSO3: Design and analyze specific engineering problems of communication, electronic circuits, computer programming, embedded systems, VLSI design and semiconductor technology by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.

PSO4: Graduates will be able to communicate effectively with excellent interpersonal skills and demonstrate the practice of professional ethics for societal benefit.

PSO5: Graduates will be able to apply fundamentals of electronics in various domains of analog and digital systems and also use embedded system concepts for developing IoT applications.

B.Sc., ELECTRONICS & COMMUNICATION abstract under LOCF-CBCS Pattern

With effect from 2021-2022 onwards

Structure of Credit Distribution as per the TANSCHE / UGC Guidelines

S. No	Study Components	Part	Sem I No. of Paper	Sem I Credit	Sem II No. of Paper	Sem II Credit	Sem III No. of Paper	Sem III Credit	Sem IV No. of Paper	Sem IV Credit	Sem V No. of Paper	Sem V Credit	Sem VI No. of Paper	Sem VI Credit	No. of Paper	Total Credit
1	LANGUAGE - I	I	1	3	1	3	1	3	1	3					4	12
2	LANGUAGE - II	II	1	3	1	3	1	3	1	3					4	12
3	DISCIPLINE SPECIFIC COURSE(DSC)-THEORY	III	2	8	2	8	1	4	1	4	2	8	2	7	10	39
4	DSC - PRACTICAL	III			1	2	1	2	1	2	2	4	1	2	6	12
5	GENERIC ELECTIVE COURSES(GEC)- THEORY	III	1	4	1	4	1	4	1	4					4	16
6	GEC PRACTICAL	III			1	2	1	2	1	2					3	6
7	DISCIPLINE SPECIFIC ELECTIVE COURSES(DSE)	III									2	8	2	8	4	16
8	PROJECT WORK	III											1	4	1	4
9	INTERNSHIP	III													0	0
10	ONLINE - COMPETITIVE EXAMINATION	III									1	2			1	2
11	SKILL ENHANCEMENT COURSES(SEC)-SBEC	IV					1	2	1	2	1	2	1	2	4	8
12	NON MAJOR ELECTIVE COURSES(NMEC)	IV					1	2	1	2					2	4
13	PROFESSIONAL ENGLISH	IV	1	2	1	2									2	4
14	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)-EVS	IV			1	2									1	2
15	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)- VALUE EDUCATION - YOGA	IV	1	2											1	2
16	EXTENSION ACTIVITY	V											1	1	1	1
	Cumulative Credits		7	22	9	26	8	22	8	22	7	22	9	26	48	140

Total No.of Subjects	48
Marks	4400

PART	No. of Credits
PART - I	12
PART - II	12
PART - III	95
PART - IV	20
PART - V	1
Grand Total	140

Extra Credit	2
	142

MUTHAYAMMAL COLLEGE OF ARTS & SCIENCE

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) - RASIPRAM - 637 408
Scheme of Examinations LOCF-CBCS Pattern
(For the Students Admitted from the Academic Year: 2021-2022 Onwards)
Programme: B.Sc. ELECTRONICS & COMMUNICATION

SEM	PART	COURSE CODE	TITLE OF THE COURSE	Hrs./W Lect	Hrs./W Lab	CREDIT POINTS	CIA	ESE	Total
I	I	21M1UFTA01	TAMIL-I	5	·	3	25	75	100
I	II	21M1UCEN01	COMMUNICATIVE ENGLISH-I	5	·	3	25	75	100
I	III	21M1UELC01	SEMICONDUCTOR DEVICES	4	·	4	25	75	100
I	III	21M1UELC02	APPLIED ELECTRIC CIRCUITS	4	·	4	25	75	100
I	III	21M1UMAA03	ALGEBRA AND DISCRETE MATHEMATICS	4	·	4	25	75	100
I	III	21M2UELP01	PRACTICAL : BASIC ELECTRONICS	·	3	·	·	·	·
I	III	21M2UMAAP2	PRACTICAL : ALLIED MATHEMATICS	·	2	·	·	·	·
I	IV	21M1UVED01	YOGA	1	·	2	100	·	100
I	IV	21M1UPES01	PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCE- I	2	·	2	25	75	100
			TOTAL	25	5	22	250	450	700
II	I	21M2UFTA02	TAMIL- II	5	-	3	25	75	100
II	II	21M2UCEN02	COMMUNICATIVE ENGLISH · II	5	·	3	25	75	100
II	III	21M2UELC03	APPLIED DIGITAL ELECTRONICS	4	·	4	25	75	100
II	III	21M2UELC04	POWER ELECTRONICS	4	·	4	25	75	100
II	III	21M2UMAA04	ALLIED : DIFFERENTIAL EQUATIONS AND INTEGRATION	4	·	4	25	75	100
II	III	21M2UELP01	PRACTICAL : BASIC ELECTRONICS	·	3	2	40	60	100
II	III	21M2UMAAP2	PRACTICAL : ALLIED MATHEMATICS	·	2	2	40	60	100
II	IV	21M2UEVS01	ENVIRONMENTAL STUDIES	1	·	2	100	·	100
II	IV	21M2UPES02	PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCE- II	2	·	2	25	75	100
			TOTAL	25	5	26	330	570	900
III	I	21M3UFTA03	TAMIL-III	5	·	3	25	75	100
III	II	21M3UCEN03	COMMUNICATIVE ENGLISH - III	5	·	3	25	75	100
III	III	21M3UELC05	ELECTRONIC CIRCUITS	4	·	4	25	75	100
III	III	21M3UCSA02	ALLIED: C PROGRAMMING	4	·	4	25	75	100
III	III	21M3UELP02	PRACTICAL : ELECTRONIC CIRCUITS	·	3	2	40	60	100
III	III	21M3UCSAP2	PRACTICAL : PROGRAMMING IN C	·	3	2	40	60	100
III	IV	21M3UELS01	8051 MICROCONTROLLER AND ITS APPLICATIONS	4	·	2	25	75	100
III	IV	21M3UPHN01	NMEC - I (PHYSICS IN EVERYDAY LIFE)	2	·	2	25	75	100
			TOTAL	24	6	22	230	570	800

SEM	PART	COURSE CODE	TITLE OF THE COURSE	Hrs / W Lect	Hrs / W Lab	CREDIT POINTS	MAX.MARKS CIA	MAX.MARKS ESE	MAX.MARKS Total
IV	I	21M4UFTA04	TAMIL - IV	5	.	3	25	75	100
IV	II	21M4UCEN04	COMMUNICATIVE ENGLISH - IV	5	.	3	25	75	100
IV	III	21M4UELC06	PRINCIPLES OF COMMUNICATION SYSTEMS	4	.	4	25	75	100
IV	III	21M4UCSA04	ALLIED: PYTHON PROGRAMMING	4	.	4	25	75	100
IV	III	21M4UELP03	PRACTICAL : COMMUNICATION SYSTEMS	.	3	2	40	60	100
IV	III	21M4UCSAP4	PRACTICAL : PYTHON PROGRAMMING	.	3	2	40	60	100
IV	IV	21M4UELS02	MODERN ELECTRONIC MEASUREMENTS AND INSTRUMENTS	4		2	25	75	100
IV	IV	21M4UPHN02	NMEC - II (ESSENTIAL OF ELECTRICITY)	2	.	2	25	75	100
			TOTAL	24	6	22	230	570	800
V	III	21M5UELC07	LINEAR INTEGRATED CIRCUITS AND ITS APPLICATIONS	5	.	4	25	75	100
V	III	21M5UELC08	EMBEDDED SYSTEMS AND PIC MICROCONTROLLER	5	.	4	25	75	100
V	III	21M5UELP04	PRACTICAL : LINEAR INTEGRATED CIRCUITS	.	4	2	40	60	100
V	III	21M5UELP05	PRACTICAL : EMBEDDED SYSTEMS	.	4	2	40	60	100
V	III	21M5UELE01	ELECTIVE - I	5	.	4	25	75	100
V	III	21M5UELE02	ELECTIVE - II	5	.	4	25	75	100
V	IV	21M5UELS03	COMPETITIVE SKILLS	2	.	2	25	75	100
			TOTAL	22	8	22	205	495	700
VI	III	21M6UELC09	PCB DESIGN AND FABRICATION	4	.	3	25	75	100
VI	III	21M6UELC10	VLSI DESIGN AND VHDL PROGRAMMING	4	.	4	25	75	100
VI	III	21M6UELE03	ELECTIVE - III	4	.	4	25	75	100
VI	III	21M6UELE04	ELECTIVE - IV	4	.	4	25	75	100
VI	III	21M6UELP06	PRACTICAL : VHDL PROGRAMMING	.	4	2	40	60	100
VI	III	21M6UELPR1	PROJECT WORK	.	8	4	40	60	100
VI	III	21M6UELOE1	ELECTRONICS AND COMMUNICATION FOR COMPETITIVE EXAMINATIONS	.	.	2	100	.	100
VI	IV	21M6UELS04	LIFE AND ENTREPRENEURSHIP DEVELOPMENT SKILLS	2	.	2	25	75	100
VI	V	21M6UEXA01	EXTENSION ACTIVITY	.	.	1	100	.	100
			TOTAL	18	12	26	405	495	900
			OVERALL TOTAL	138	42	140	1650	3150	4800
VI		21M6UELEC1	MOOC Courses offered in SWAYAM / NPTEL	.	.	2	.	.	.

S. Arul
14/2/23

HEAD OF THE DEPARTMENT
ELECTRONICS & COMMUNICATION
Muthayammal College of Arts & Science
Rasipuram - 637 408, Namakkal Dt
Tamil Nadu

PRINCIPAL
MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
RASIPURAM - 63
NAMAKKAL D

UG-REGULATION

1. InternalExamination Marks- Theory

Components	Marks
CIA I&II	15
Attendance	5
Assignment	5
Total	25

Attendance Percentage	Marks
96 %to 100%	5
91%to 95%	4
86%to 90%	3
81%to 85%	2
75%to 80%	1
Below 75%	0

2. QUESTIONPAPERPATTERNFORCIA I,II AND ESE(3HOURS)   MAXIMUM:75Marks

SECTION-A (10 Marks) (Objective Type)

AnswerALLQuestions

ALLQuestionsCarryEQUAL Marks   (10 x1=10 marks)

SECTION-B(10 Marks)(Short Answer)

AnswerALLQuestions

ALLQuestionsCarryEQUAL Marks   (5 x 2 = 10 marks)

SECTION-C (25 Marks)(Either or Type)

AnsweranyFIVEquestions

ALLQuestionsCarryEQUALMarks

Eitheror Type.(5 x 5 = 25 marks)

SECTION-D (30 Marks)(Analytical Type)

AnsweranyTHREEQuestionsout of FIVEquestions

ALLQuestionsCarryEQUALMarks   (3 x 10 = 30 marks)

(Syllabus for CIA-I 2.5 Unit ,Syllabus for CIA-II All 5 Unit)

2a)ComponentsforPractical CIA.

Components	Marks
CIA -I	15
CIA - II	15
Observation Note	5
Attendance	5
Total	40

2.b)ComponentsforPracticalESE.

Components	Marks
CompletionofExperiments	50
Record	5
Viva	5
Total	60

3. GuidelinesforValue Education Yoga and Environmental Studies (PartIV)

- TheCourse Value Education Yogaistobetreatedas100%C I Acoursewhichisofferedinl Semesterforl year UGstudents.

- TheCourseEnvironmentalStudiesistobetreatedas100%CIAcoursewhichisofferedinII Semesterforl year UGstudents.

- TotalMarks fortheCourse=100

Components	Marks
TwoTests(2 x30)	60
Fieldvisitandreport(10+10)	20
Twoassignments(2 x10)	20
Total	100

The passing minimum for this course is 40%

- Incase,thecandidatefailstosecure40%passingminimum,he/shemayhavetoreappear forthesame in the subsequent odd/even semesters.

4. GuidelinesforExtension Activity(PartV)

- Atleasttwoactivitiesshouldbeconductedwithinsemesterconsistingoftwodayseach
.

- TheactivitiesmaybeEducatingRuralChildren,UnemployedGraduates,SelfHelpGroupetc.

Themarks maybeawarded as follows

NoofActivities	Marks
2 x50 (Each Activityfor twodays)	100

5. Internship/IndustrialTraining,MiniProjectandMajorProjectWork

Internship/IndustrialTraining		MiniProject	MajorProjectWork		
Components	Marks	Marks	Components		Marks
CIA*[2] WorkDiary Report Viva-voce Examination	25 50 25	- 50 50	CIA a) Attendance b) Review /WorkDiary *[1]	10 Marks 30 Marks	40
Total	100	100	ESE*[2] a)FinalReport b)Viva-voce	40Marks 20Marks	60
			Total		100

*[1]ReviewisforIndividualProjectandWorkDiaryisforGroupProjects(Groupconsistingofminimum3 and maximum 5)

*[2]Evaluationof report and conductof viva vocewill bedonejointlybyInternal andExternalExaminers

6. Guidelinesfor Competitive Exams- Online Mode(PartIII)- Online Exam 3 hours

Components	Marks
100 Objective Type Questions 100*1=100 Marks	100

Objective type Questions from Question Bank.

- Thepassingminimum forthis paper is40%
- Incase,thecandidatefailstosecure40%passingminimum,he/shemayhavetoreappear forthesamein the subsequent semesters.

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B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UELC01	SEMICONDUCTOR DEVICES	DSC THEORY-I	I	4	4	-	-	4

Objective	To enable the students to understand and gain the knowledge on semiconductor devices and to acquaint the students with construction, theory and characteristics of the various kinds of electronic devices.

Unit	Course Content	Knowledge Levels	Sessions
I	**Semiconductors and PN Junction Diode:** Structure of an Atom - Atomic Number - Valence Electrons - Bonding in Conductors - Insulators - Semiconductors - Energy Band Structure and Conduction in Insulator - Semiconductor - Conductor - Intrinsic Semiconductors - Extrinsic Semiconductor - Doping - P Type Semiconductor - N type Semiconductor- Formation for PN Junction - PN Junction Diode - Characteristics - Drift Current and Diffusion Current- Applications of PN junction Diode.	K1-K2	8
II	**Special Diodes:** Zener Diode - Varactor Diode- Shcottkey Diode -Tunnel Diode - Impatt Diode - PIN Diode - PNPN Diode Construction - Operation - Characteristics - Applications - Breakdown - Zener diode as a voltage regulator.	K2-K3	11
III	**BJT and Biasing:** Introduction to Bipolar Junction Transistor - Construction - Transistor Biasing - Operation of NPN and PNP Transistor - CB, CE and CC Configuration - Input Characteristics - Output Characteristics - Transfer Characteristics - Comparison - Bias Stability - Load Line . **Method of Biasing:** Fixed Bias - Collector to Base Bias - Voltage Divider Bias - Bias Compensation - Thermal Runaway - Heat Sink.	K3-K4	8
IV	**Field Effect Transistors and UJT: JFET:** Introduction to FET - Types -Construction - Operation - Characteristics of JFET - Applications of JFET - JFET as a Voltage Variable Resistor - Comparison of FET and BJT **MOSFET:** Construction - Operation - Characteristics of MOSFET - Applications of MOSFET - Comparison of E-MOSFET and DE_MOSFET. **UJT:** Construction - Operation - Characteristics of UJT - Applications of UJT - UJT as Relaxation Oscillator	K2	10
V	**Opto Electric Devices:** Introduction to Opto electric devices - Construction - Operation and Characteristics of Opto Electronic Devices - LDR - Photo Diode - Photo Transistor - Photo Voltaic Cell - Solar Cell - LED - IR Emitter - LCD - Opto couplers-LASER Diode	K3-K4	8

	CO1: Recognize the various concepts of semiconductor Physics.	K1	
ourse Outcome	CO2: Understand the oeration and characteristics of various semiconductor devices.	K2	
	CO3: Apply the operation of the devices to various application design.	K3	45
	CO4: Illustrate the functionality of different kinds of special diodes and opto electric devices.	K3	
	CO5: Analyse the characteristics of the devices in different aspects.	K4	

Learning Resources

Text Books	1. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "Electronics Devices And Circuits", Tata McGraw Hill Publishing Company Limited, New Delhi, 8th edition. 2. V.K.Metha, Rohit Metha, —Principles of Electronics" S Chand, 2006 . 3. R. S. Sedha, " A TextBook of Applied Electronics" , S.Chand and Company Ltd., 2010.
Reference Books	1. S.L. Kakani,K. C. BhanDai—A text book Of Electronics 2. BernardGrob"Basic Electronics"-Tata McGraw-Hill Publishing Company Limited,New Delhi.
Website Link	https://nptel.ac.in/courses/108/108/108108122/ https://nptel.ac.in/courses/108/108/108108112/ https://nptel.ac.in/courses/115/102/115102103/

L-Lecture, T-Tutorial, P-Practical, C-Credit
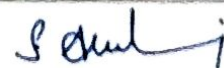
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UELC01	SEMICONDUCTOR DEVICES	DSC THEORY - I	I	4	4	-	-	4

CO-PO Mapping:

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	S	S	S	M	L	S
CO2	M	M	L	L	S	M	S	M	L	S
CO3	S	M	L	M	M	S	S	M	L	M
CO4	M	M	L	M	M	S	S	S	L	S
CO5	M	M	L	M	S	M	M	S	L	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion,Lab Visit,Problem Solving,Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk,Visulaisation and Smart Class
Assessment Methods	Unit Test,Assignment,Internal & Semester Examinations

Designed By	Verified By	Approved By
MR.I. BALAKRISHNAN	MR.S.ARULMANI	
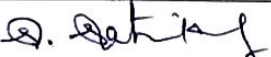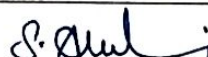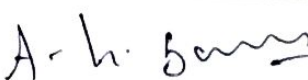
B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UELC02	APPLIED ELECTRIC CIRCUITS	DSC THEORY - II	I	4	4	-	-	4

Objective	To remember the students about various electronic components, DC and AC fundamentals, by which understand the various circuit analysis methods and theorems.

Unit	Course Content	Knowledge Levels	Sessions
I	**Circuit Components:** Resistors - Capacitors - Inductors – Types - Factors governing the Resistance- Capacitance - Inductance -Color Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor - Series and Parallel connections- Simple Problems.	K1-K2	10
II	**DC Fundamentals:** Potential Difference-current-Power-Ohms Law-Kirchoff's Laws-Voltage Source- Current Source-Series and Parallel combinations of Sources-Voltage Division Rule-Current Division Rule-Simple Problems.	K3	8
III	**Theorems:** Super Position Theorem - Thevenin's Theorem - Norton's Theorem - Millman's Theorem - Maximum Power Transfer Theorem - Star and Delta Connection- Conversion - Simple Problems.	K3-K4	10
IV	**AC Fundamentals:** Representation of Sinusoidal and Non Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period and Frequency Measurement - Power Factor - Real Power – Reactive Power – Capacitive Reactance - Inductive Reactance - Simple Problems.	K4	8
V	**Resonant Circuits:** AC through Resistor - Capacitor – Inductor - RL Series circuit - RC Series Circuit - RL Parallel Circuit – RC Parallel Circuit - RLC in Series Circuit – RLC Parallel Circuits – Series Resonance - Parallel Resonance - Simple Problems.	K3	9
Course Outcome	CO1: Recite and restate the basic electrical parameters and their units.	K1-K2	45
	CO2: Summarize the various Laws and theorems of circuit simplification.	K2	
	CO3: Perform the circuit simplification using various circuit theorems.	K3	
	CO4: Simplify the various problems and find the solutions to it.	K4	
	CO5: Categorize and analyze the different AC and DC circuits.	K4	

Learning Resources	
Text Books	1. Circuits and Networks: Analysis and Synthesis - 5th Edition by A. Sudhakar, ShyammohanS.Palli-2017 2. A Text Book of Applied Electronics, R.S.Sedha, S.Chand and Company Ltd., 2010. 3. Circuit Theory - S. Salivahanan,S. Praveen Kumar - S.Chand

Reference Books	1.B.L.Theraja, "Basic Electronics-Solid State Devices",S.Chand Company 2.Basic Electronics - Bernard Grob - Mcgraw Hill. 3. Electronic Devices and Circuits - S. Salivahanan, N. SureshKumar- 4th Edition 2017
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee93/preview https://nptel.ac.in/courses/108/104/108104139/ https://nptel.ac.in/courses/108/101/108101091/ https://www.youtube.com/playlist?list=PLFF553CED56CDE25D https://www.youtube.com/watch?v=w8Dq8blTmSA

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M1UELC02	APPLIED ELECTRIC CIRCUITS	DSC THEORY - II	I	4	4			4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	M	M	M	S	M	L	M
CO2	S	M	L	M	M	M	S	S	L	M
CO3	S	M	L	M	M	M	S	S	L	M
CO4	S	M	L	M	M	M	S	S	L	M
CO5	S	M	L	M	M	M	S	S	L	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. S. SATHISHKUMAR	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELC03	APPLIED DIGITAL ELECTRONICS	DSC THEORY - III	II	4	4	-	-	4
Objective	To acquire the basic knowledge of Number system, Digital logic circuits and its application and to outline the formal procedures for the analysis and design of combinational and sequential circuits, implementation and design of data conversion circuits.								
Unit	Course Content		Knowledge Levels		Sessions				
I	**Number systems:** Binary Signals - Binary Number System - Decimal Number System - Octal Number System - Hexadecimal Number System - Conversion from One Number System to Another Number System - BCD - Gray code - Excess 3 Code - ASCII code. **Boolean algebra:** Binary Arithmetic - 1's and 2's Complements - 9's & 10's Complements- Basic laws - Duality Theorem - De Morgan's Theorem - SOP and POS- Karnaugh Maps upto 4 variables.		K1-K2		10				
II	**Combinational Elements:** Logic Gates - AND, OR, NOT, EX-OR, EX-NOR, NAND & NOR - Logic Gates using Discrete Components - Universal Gates - Half & Full Adder - Half & Full Subtractor -4 bit Binary adder- Encoder - Decoder - Multiplexer - Demultiplexer - Implementation using 74147, 7442, 74153 & 74155 IC's.		K3		8				
III	**Sequential Elements:** Flip Flops- RS - Clocked RS - JK - JK Master Slave - D & T Flip Flops - Shift Registers : SIPO - SISO - PIPO - PISO - Shift Left - Shift Right - Counters - Hexadecimal Up - Hexadecimal Down - Modulo Up - Modulo Down - UP/DOWN Counters - Decade Counter - Ring counter - Twisted Ring Counter . Johnson Counter - Implementation Using 7476, 7495, 7493 & 7490 IC's.		K3		10				
IV	**A/D AND D/A Conversion:** Parallel Comparator Type of ADC - Counter Ramp Type of ADC - Successive Approximation Type of ADC - Dual Slope Type of ADC - ADC Accuracy and Resolution - Binary weighted Resistor type of DAC - R-2R Ladder Type of DAC - DAC Accuracy and Resolution - Implementation using ADC 0809 & DAC 0800 IC's.		K4		8				
V	**8085 Microprocessor:** Introduction - Pin details - Architecture - Addressing Modes - Instruction formats- Classification of Instruction Set - Machine Cycles of Opcode Fetch, Memory Read/Write, IN and OUT instructions- Stack and Stack Operations - Interrupts - Applications.		K3		9				

	CO1: Recognize and outline the various number systems and Boolean Algebra.	K1
	CO2: Understand and apply the design procedure of digital circuits.	K2
Course Outcome	CO3: Demonstrate the design procedures over combinational and sequential circuits.	K3
	CO4: Perform the data conversion process using various A/D and D/A converters.	K3
	CO5: Illustrate and analyze the digital logics using basic microprocessor.	K4

Learning Resources

Text Books	1. Digital Principles and Applications. 8th Edition- Donald, P.Leach, Albert Paul Malvino and Goutam Saha. 2014. Tata Mc Graw Hill, New Delhi. 2. Digital Circuits and Design.4th Edition S. Salivahanan S.Chand- 2012. 3. Microprocessor Architecture, Programming and Applications With the 8085/8080A - Ramesh.S Gaonkar New Age International - 5th Edition.
Reference Books	1. Digital Technology Principles and Practice. 2nd Edition- Virendra Kumar. 2015. New Age International publications, New Delhi. 2. Integrated Electronics Analog and Digital Circuits and Systems. [Second Edition].- Jacob Millman and Christos Halkias. 2011. Tata Mc Graw Hill Publishing Company Limited, New Delhi.
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee110/preview https://onlinecourses.swayam2.ac.in/cec21_cs16/preview https://onlinecourses.swayam2.ac.in/cec22_cs17/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELC03	APPLIED DIGITAL ELECTRONICS	DSC THEORY - III	II	4	4	-	-	4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	S	M	M	M	M	M	L
CO2	S	M	L	S	M	S	M	M	M	M
CO3	L	M	L	S	M	S	M	M	M	M
CO4	M	M	L	M	S	L	M	S	S	M
CO5	M	M	L	M	M	S	M	S	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
S.Arul	S.Arul	A. h. Sar
MR.S.ARULMANI	MR.S.ARULMANI	
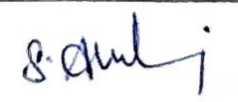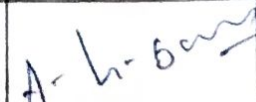
B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELC04	POWER ELECTRONICS	DSC THEORY - IV	II	4	4	-	-	4
Objective	To acquire knowledge on various power semiconductor devices and their characteristics, and to study the principle of operation, design and synthesis of different types of power supplies and their applications.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Power Semiconductor Devices:** Thyristor family – Working principle ,VI characteristics, Applications of SCR – Definitions for holding current, latching current, dv/dt rating, di/dt rating- Symbol, principle of working ,VI characteristics ,applications of IGBT - MOSFET and GTO.	K1-K2	8
II	**Triggering and Commutation Techniques:** Triggering of SCR - Gate triggering methods – Concepts of DC triggering, AC triggering, Pulse gate triggering – Pulse transformer in trigger circuit - Electrical isolation by opto isolator - Resistance firing circuit and waveform – Resistance capacitor firing circuit and waveform, Synchronized UJT triggering . Commutation – SCR Turn Off Methods – Natural Commutation – Forced Commutation – Class A, Class B, Class C, Class D, Class E and Class F. SCR rating and their importance.	K2-K3	10
III	**Converters and Choppers:** Converters - Definition – Single phase Half controlled bridge converter with R load and RL load- importance of flywheel diode – Single phase fully controlled bridge converter with R load – voltage and current waveforms – Single phase fully controlled bridge converter with RL load –voltage and current waveforms. **Choppers:** Introduction – applications -principle of chopper-control strategies (time ratio and current limit control)-types of chopper- type A, B, C, D, and E- step up chopper –Jones chopper – Morgan chopper-chopper using MOSFET – PWM control circuit for driving MOSFET in chopper.	K2-K3	10
IV	**Inverter:** Definition Requirement of an inverter –Single phase inverter with resistive load – Single phase inverter with RL load –Methods to obtain sine wave output from an inverter- output voltage control in inverters - McMurray inverter – advantages- Basic 3 phase bridge inverter with 120 conduction mode – circuit, trigger sequence, waveform – Through pass inverter – Parallel inverter using IGBT. UPS – Need for UPS -ON Line UPS -OFF Line UPS - Comparison of ON line and OFF line UPS -DC Transmission- principle - advantages - drawbacks.	K4	9

V	**AC Voltage Regulators:** Introduction to AC Voltage Controller - Principle of On-Off Control - Principle of Phase Control - Single Phase voltage Controller with Resistive Loads - Single Phase voltage Controller with RL load -Three Phase Full Wave Controller - Cyclo converters - Single Phase Cyclo converters - AC Voltage controllers with PWM Control.	K3-K4	8

Course Outcome	CO1: Remember and Describe the construction and operation of Power Semiconductor devices.	K1
	CO2: Interpret the methods of triggering and commutation Techniques used in thyristor circuits.	K2
	CO3: Analyze and determine the operation of controlled rectifier and Chopper circuits.	K3
	CO4: Demonstrate the operation of inverters in various applications.	K4
	CO5: Categorize the various DC and AC power supply based on Performance.	K4

Learning Resources

Text Books	1. Muhammed H. Rashid - " Power Electronics" PHI - 2nd Edition 2. Jaganathan, " Power Electronics"- PHI - 2nd Edition.
Reference Books	1. Singh M D and Khanchandani K B ,2007, Power electronics[Second Edition],Tata Mcgraw hill, Delhi. 2. Mithal.G.K,2000 , Industrial electronics and control [Eighteenth Edition],Tata Mcgraw hill , Newdelhi 3. Theraja B.L, Theraja.A.K, 2003, Electrical Technology [First Edition], S.Chand, Newdelhi.
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee127/preview https://www.coursera.org/specializations/power-electronics https://www.coursera.org/learn/power-electronics

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELC04	POWER ELECTRONICS	DSC THEORY - IV	II	4	4	-	-	4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	M	M	M	M	M	M	M
CO2	M	L	L	M	M	M	M	M	M	M
CO3	M	L	L	M	M	M	M	S	M	M
CO4	M	M	L	M	S	M	M	S	S	M
CO5	M	M	L	M	M	M	M	S	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

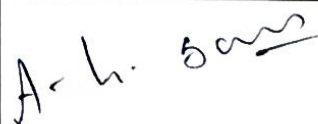|	Designed By	Verified By	Approved By
	DR.M.KUTRALEESWARAN	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELP01	PRACTICAL: BASIC ELECTRONICS	DSC PRACTICAL - I	II	3	-	1	2	2

Objective	To get familiarized with the various electronics instruments and components which basically equip them to construct complex circuits in near future.

S. No.	List of Experiments / Programmes (Any 22)	Knowledge Levels	Sessions
1	Colour Coding of Resistors.	K1	3
2	PN Junction Diode Characteristics.	K3	3
3	Zener Diode Characteristics.	K3	3
4	Input, Output & Transfer characteristics of CE Configuration.	K3	3
5	JFET Characteristics.	K3	3
6	SCR Characteristics.	K3	3
7	DIAC / TRIAC Characteristics	K3	3
8	LDR Characteristics.	K3	3
9	Photo transistor Characteristics.	K3	3
10	Amplitude and Frequency Measurement Using CRO.	K4	3
11	Lissogious pattern for frequency and phase Measurement.	K4	3
12	Verification of Ohm's Law.	K4	3
13	Verification of KVL and KCL.	K4	3
14	Verification of Thevinin's theorem.	K4	3
15	Verification of Notorn's theorem.	K4	3
16	Verification of Super position theorem.	K4	3
17	Frequency response of RLC series and Parallel Circuits.	K4	3
18	Truth Table Verification of Basic Gates.	K4	3
19	NAND and NOR as a Universal Gate (Any 3 Logics)	K5	3
20	Verification of De Morgan's Theorem.	K5	3
21	Truth Table Verification of Half Adder & Full Adder.	K5	3
22	Truth Table Verification of Half Subtractor & Full Subtractor.	K5	3
23	Encoder Using 74147 IC	K6	3
24	Decoder Using 7442 IC	K6	3
25	Multiplexer Using 74153 IC	K6	3
26	Demultiplexer Using 74155 IC	K6	3
27	Parity Generator and Checker.	K6	3
28	MS JK Flip Flop Using 7476 IC	K6	3
29	Parallel In Parallel Out Shift Register Using 7495 IC	K6	3
30	Up Counter Using 7490 IC or 7493 IC.	K6	3
Course Outcome	CO1: Recall the colour coding of resister, measurement of voltage, current and frequency.		K1
	CO2: Simplify the complex circuits to small circuits using various laws and Theorems		K4
	CO3: Design and Evaluate the operations of various gates and Combinational logic circuits.		K5
	CO4: Evaluate and Justify the working of special digital ICs		K5
	CO5: Build the DC regulated power supply.		K6

Learning Resources

Text Books	1. K A Navas - " Electronics Lab Manual- Volume-I " - 6th Edition - PHI Learning Pvt.Ltd., New Delhi.
Reference Books	2. A. M. Zungeru, J. M. Chuma, M. Mangwala, H. U. Ezea," Handbook of Laboratory Experiments in Electronics Engineering Vol. 1, Volume 1" Notion Press, Incorporated, 2016
Website Link	http://vlabs.iitkgp.ernet.in/be/# http://vlabs.iitkgp.ac.in/dec/#

L-Lecture, T-Tutorial, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M2UELP01	PRACTICAL: BASIC ELECTRONICS	DSC PRACTICAL - I	II	3	-	1	2	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	L	L	M	S	S	L	M
CO2	S	M	L	S	L	M	M	S	L	M
CO3	M	M	L	M	M	M	S	S	M	M
CO4	S	M	L	S	M	M	L	S	S	M
CO5	S	M	L	S	M	M	M	S	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Practical in Laboratory
Teaching and Learning Methods	Laboratory Equipments
Assessment Methods	Observation of Records, Model Practical

Designed By	Verified By	Approved By
MR.I. BALAKRISHNAN	Mr.S. ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELC05	ELECTRONIC CIRCUITS	DSC THEORY - V	III	4	4	-	-	4

Objective	To acquaint the students to understand and gain the knowledge on power supplies, various amplifiers, Oscillators and Multivibrators.								

Unit	Course Content	Knowledge Levels	Sessions
I	**Power Supply:** Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Average value - RMS value - Form factor - Peak factor - Ripple factor - Efficiency - TUF - PIV - Filters : C, L, LC, CLC, CRC – Voltage Regulators : Series Regulators - Shunt Regulators - IC Voltage Regulators (78XX & 79XX) -Design of dual IC regulated power supply	K1-K3	8
II	**Wave shaping circuits:** introduction to Wave Shaping Circuits – RC & RL Circuits – Basic Differentiator - Basic Integrator - Clipping Circuits - Clamping Circuits - Voltage Doublers - Tripler - Quadrupler.	K3	8
III	**BJT Amplifiers:** Transistor as an amplifier-Small signal Analysis of Common Emitter-AC Load line, Voltage swing limitations- Common collector amplifier- common base amplifiers – Differential amplifiers- CMRR- Darlington Amplifier- Bootstrap technique - Cascaded stages - Cascade Amplifier-Large signal Amplifiers - Class A, Class B and Class C Power Amplifiers	K3-K5	10
IV	**Feedback Amplifiers:** Basics concepts of Feedback - Effects of negative feedback - Gain-Bandwidth- Distortion, Noise- Input and Output Impedance - Types of Negative Feedback - Voltage Series - Voltage Shunt - Current Series and Current Shunt Feedback.	K3-K5	11
V	**Oscillators and Multivibrators:** Concept of sustained oscillation- Barkhausen Criterion- Classification of Oscillators - Hartley Oscillator – Colpitt' Oscillator - Clapp Oscillator - Phase Shift Oscillator - Wein Bridge - Crystal Oscillator - Frequency stability of Oscillators - Astable Multivibrator - Monostable Multivibrator - Bistable Multivibrator - Schmitt Trigger.	K4	8
Course Outcome	CO1: Remember the applications of diodes and apply it over power supply design	K1-K3	45
	CO2: Interpret the functionality of different wave shaping circuits using diode.	K2	
	CO3: Classify and Model the BJT amplifiers based on the frequency, power and coupling method.	K3-K4	
	CO4: Analyze the principles of feedback systems behind the design of amplifiers and oscillators.	K3-K4	
	CO5: Evaluate the performance of various electronic circuits.	K5	

Learning Resources

Text Books	1.S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "Electronics Devices And Circuits", Tata McGraw Hill Publishing Company Limited, New Delhi, 8th edition. 2.V.K.Metha, Rohit Metha, ―Principles of Electronics" S Chand, 2006 . 3. R. S. Sedha, " A TextBook of Applied Electronics" , S.Chand and Company Ltd., 2010.
Reference Books	1. B.Sasikala, C.Poornachandra,‖Electronic Devices and Circuits", Scitech 2003. 2. B. L. Theraja, "Basic Electronics - Solid State Devices", S.Chand&CompanyLtd. 2000
Website Link	http://www.ee.iitm.ac.in/~ani/2012/ec5135/lectures.htmlLecture Notes https://nptel.ac.in/courses/108/102/108102095/Analog Electronic circuits NPTEL. https://nptel.ac.in/courses/108/102/108102097/#Introduction to Electronic circuits NPTEL.

L-Lecture, T-Tutorial, P-Practical, C-Credit
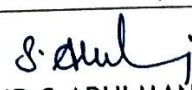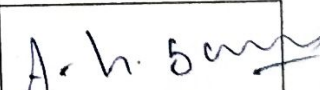
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELC05	ELECTRONIC CIRCUITS	DSC THEORY - V	III	5	4	1	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	M	M	S	S	M	M	M
CO2	M	L	L	L	M	S	S	M	L	M
CO3	M	M	L	M	L	S	M	M	L	M
CO4	M	M	L	M	M	M	M	M	M	S
CO5	M	M	L	M	M	S	S	M	M	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR.I. BALAKRISHNAN	MR.S.ARULMANI	
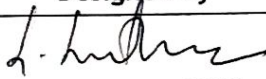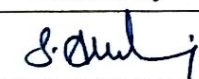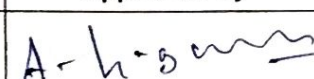
B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELS01	8051 MICROCONTROLLER AND ITS APPLICATIONS	SEC - I	III	4	2	2		2

Objective	To make students learn the architecture and addressing modes of 8051 and to Impart knowledge about assembly language programming of 8051 and also to understand the importance of different peripheral devices with their interfacing to 8051.

Unit	Course Content	Knowledge Levels	Sessions
I	**Architecture & Addressing modes of 8051:** Comparison of Microprocessor and Microcontroller - Block diagram of Microcontroller -Functions of each block - Pin details of 8051 - ALU -ROM- RAM - Memory Organization of 8051 - Special function registers -Program Counter - PSW register - Stack - I/O Ports - Timer - Interrupt - Serial Port - Oscillator and Clock - Clock Cycle - State - Machine Cycle - Instruction cycle - Reset - Power on Reset. Addressing Modes: Different addressing modes of 8051.	K1-K2	8
II	**Instruction Set and Programming Examples:** Instruction set of 8051 - Classification of 8051 Instructions - Data transfer instructions - Arithmetic Instructions - Logical instructions -Branching instructions - Bit Manipulation Instructions **Programming Examples:** Multibyte Addition - 8 Bit Multiplication and Division - Biggest Number / Smallest Number - Ascending order / Descending order BCD to ASCII Conversion - ASCII to Binary Conversion - Odd Parity Generator - Even Parity Generator -Time delay routines.	K2-K3	10
III	**I/O Programming and Timer:** Bit addresses for I/O and RAM - I/O programming - I/O bit manipulation programming. Programming 8051 Timers - Timer 0 and Timer 1 registers - Different modes of Timer - Mode 0 Programming – Mode 1 Programming - Mode 2Programming - Counter programming – Different modes of Counter – Mode 0 Programming – Mode 1 Programming -Mode 2 Programming (simple programs)	K3	8
IV	**Interrupt and serial Programming: Interrupt:** 8051 Interrupts - Programming Timer Interrupts - Programming external hardware interrupts - Programming the serial communication interrupt -Interrupt priority in 8051 (simple programs). **Serial Communication:** Basics of Serial programming - RS 232 Standards - 8051 connection to RS 232 - 8051 Serial Communication Programming - Programming 8051 to transmit data serially - Programming 8051 to Receive data serially.	K3	9

V	Interfacing Techniques: IC 8255 PPI - Block Diagram - Modes of 8255 - 8051 interfacing with the 8255 - Interfacing external memory to 8051-- ASM Programming Switch and LED Interfacing- Relays - Sensor interfacing - ADC interfacing - DAC interfacing - Keyboard interfacing - Seven segment LED Display Interfacing - Stepper Motor interfacing - DC motor interfacing using PWM.	K4-K5	10

Course Outcome	CO1: Identify and summarize the difference between microprocessors and microcontrollers.	K1-K2	
	CO2: Interpret the various hardware features of 8051 microcontroller.	K2	
	CO3: Use the various instruction set of 8051 to learn basic assembly language programming.	K3	45
	CO4: Illustrate the various hardware and interrupt programming of 8051	K4	
	CO5: Classify and select the appropriate peripheral devices to design microcontroller based systems.	K4-K5	

Learning Resources	
Text Books	1. Mohamed Ali Maszidi & Janice Gillispie Maszidi, "The 8051 Microcontroller and Embedded System", Pearson Publishers 2. Kenneth J. Ayala, "The 8051 Microcontroller Architecture, Programming and Application"2 nd Edition, Penram Int ernational Publications. 3. Intel 8031/8051 family Data Sheet - Intel corporation
Reference Books	1. Myke predko, "Programming and Customizing the 8051 Microcontroller", Tata McGraw Hill, 2. Ajit pal- "Microcontrollers, Principles and Applications" - PHI Ltd.,
Website Link	https://www.youtube.com/watch?v=84YUQu8tE4w https://www.youtube.com/watch?v=GPz_mR7Flas https://www.youtube.com/watch?v=uFhDGagZzjs

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELS01	8051 MICROCONTROLLER AND ITS APPLICATIONS	SBEC-I	III	4	2	2	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	M	M	M	M	S	M	M
CO2	M	M	L	M	M	M	M	S	M	M
CO3	M	M	L	M	M	M	M	S	S	M
CO4	M	M	L	M	M	M	M	S	S	M
CO5	S	M	L	M	S	M	M	S	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

	Designed By	Verified By	Approved By
	MR. S. SANTHOSH	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELP02	PRACTICAL: ELECTRONIC CIRCUITS	DSC PRACTICAL - II	III	3	-	1	2	2

Objective	To prepare the students to design and analyze various electronic circuits using discrete active and passive components.

S.No.	List of Experiments / Programmes (Any 10)	Knowledge Levels	Sessions
1	Half wave, Full wave and Bridge Rectifier with capacitor filter.	K1-K2	3
2	Basic Integrator and Differentiator.	K4	3
3	Clipper and Clapper Circuits (Positive and Negative)	K3-K4	3
4	Voltage Doubler and Tripler	K5	3
5	Hartley Oscillator, Colpitt's Oscillator Using Transistor.	K5	3
6	RC Phase shift Oscillator using transistor.	K5	3
7	Crystal Oscillator using Transistor	K5	3
8	UJT as relaxation Oscillator.	K5	3
9	Astable and Monostable Multivibrator Using Transistors.	K5	3
10	Bistable Multivibrator and Schmitt Trigger Using Transistors.	K5	3
11	Design of Dual Regulated Power supply using IC 78XX and 79XX.	K6	3
12	Frequency response of Two Stage RC Coupled Amplifier.	K5	3
13	Automatic Street light control using LDR.	K6	3
14	Lamp Dimmer using DIAC and TRIAC.	K6	3
15	Speed Control of DC motor using SCR.	K6	3

Course Outcome	CO1: Remember and Understand the applications of junction Diode.	K1
	CO2: Demonstrate and analyze the various wave shaping circuits using discrete components.	K3
	CO3: Evaluate the performance of electronic circuits.	K5
	CO4: Create a DC regulated Power supply.	K6
	CO5: Build a simple real time applications using basic discrete components.	K6

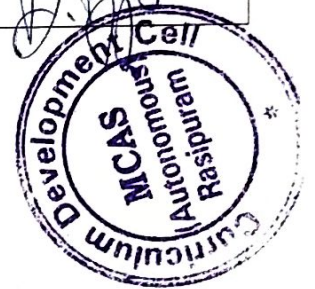| Learning Resources	
Text Books	1. K A Navas - "Electronics Lab Manual- Volume-I "- 6th Edition - PHI Learning Pvt. Ltd., New Delhi.
Reference Books	1. A. M. Zungeru, J. M. Chuma, M. Mangwala, H. U. Ezea," Handbook of Laboratory Experiments in Electronics Engineering Vol. 1, Volume 1" Notion Press, Incorporated, 2016
Website Link	http://vlabs.iitkgp.ac.in/ssd/#

L-Lecture   T-Tutorial   C-Credit

Course Code	Course Title		Course Type	Sem	Hours	L	T	P	C
21M3UELP02	PRACTICAL: ELECTRONIC CIRCUITS		DSC PRACTICAL - II	III	3	-	1	2	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	M	S	S	M	S	M	S
CO2	M	A	L	M	S	S	M	S	M	S
CO3	M	S	L	M	S	S	M	S	M	M
CO4	M	S	L	S	S	S	M	S	S	M
CO5	M	S	L	S	S	S	M	S	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Practical in Laboratory
Teaching and Learning Methods	Laboratory Equipments
Assessment Methods	Observation of Records, Model Practical

Designed By	Verified By	Approved By
MR. I. BALAKRISHNAN	Mr.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELC06	PRINCIPLES OF COMMUNICATION SYSTEMS	DSC THEORY - VI	IV	4	4	-	-	4
Objective	To understand the concept of wave propagation methods, acquire knowledge on modulation techniques and to inculcate the principle of radio Transmitters and receivers.							
Unit	Course Content				Knowledge Levels		Sessions	
I	**Wave propagations and Antennas:** EM frequency spectrum - Propagation of EM wave – Atmospheric structure - Ground wave propagation - Space wave propagation – Sky wave propagation – important terms related to sky wave propagation. **Antennas:** Definition-types of antenna- Mono pole and dipole antenna- directional and Omni directional antenna- Dipole arrays- Yagi antenna- parabolic antenna- directive gain-directivity- radiation pattern and polarization-applications.				K1-K3		8	
II	**Amplitude modulation:** Modulation - Need for modulation-Types of modulation - Amplitude modulation – AM Signal, Expression for AM, Modulation index – Power relation – AM Spectrum - DSBFC – DSBSC - SSB and VSB systems – AM Modulators – High level AM transmitter - Low level AM transmitter - SSB transmitter.				K2-K4		10	
III	**Angle Modulation:** Frequency modulation - FM Signal – Expression for FM - Modulation index – Effect of noise – Interferences – Narrow band and wide band FM - FM Modulators – FM transmitters- Direct and Indirect FM Transmitters -Stereophonic FM transmitter- Pre Emphasis - Phase Modulation: PM Signal – Phase modulator .				K2-K4		10	
IV	**Receivers:** AM Receivers: AM Demodulators - TRF Receivers - Super heterodyne receivers - Choice of IF and Oscillator Frequencies - Image Rejection – Adjacent Channel Selectivity - Spurious Response - Tracking – SSB receivers –AGC and its Types – AFC. **FM Receiver:** FM Demodulators - Super heterodyne FM receiver – Stereophonic FM receiver – De emphasis.				K3		8	
V	**Pulse Modulation:** Introduction - PAM Modulation and Detection – PWM Modulation and Detection - PPM Modulation and Detection - Sampling Theorem – Quantization - Quantization Error - Companding - PCM Modulation and Detection - ASK – FSK – BPSK – QPSK – DPSK.				K3		9	
Course Outcome	**CO1:** Recall the principles of the electromagnetic spectrum and wave propagation methods.						K1	
	CO2: Contrast and illustrate the various needs of modulation and principles of modulation techniques.						K2	
	CO3: Demonstrate and analyze the stages of AM and FM Transmitters.						K3	
	CO4: Predict and criticize the performance of different stages of communication receivers.						K3	
	CO5: Analyze the performance of various Pulse modulation techniques						K4	

Learning Resources

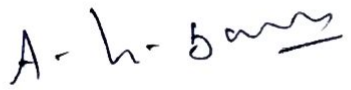|	
Text Books	1. K.D. Prasad and Satya Prakahan. "Antenna Wave Propagation" 3rd edition, 2. George Kennedy. "Electronic Communication Systems" - TMH - IV Ed. 3. Electronic Communication Systems - Roddy & Collen - PHI - IV Ed
Reference Books	1. Communication Electronics - Principles and application - Louis E Frenzel, Third Edition, Tata McGraw hill publication 2. Electronic Communications - Sanjeev Gupta - Khanna Publications. 3. Principles of Communication Engineering - Anokh Singh - S. Chanda
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee115/preview https://onlinecourses.nptel.ac.in/noc22_ee73/preview https://onlinecourses.nptel.ac.in/noc22_ee118/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELC06	PRINCIPLES OF COMMUNICATION SYSTEMS	DSC THEORY - VI	IV	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	L	L	L	M	L	L
CO2	M	M	L	M	L	M	M	M	L	M
CO3	M	M	L	M	M	M	M	M	M	M
CO4	M	M	L	M	M	M	M	M	L	M
CO5	M	M	L	L	M	M	M	M	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MRS. P. VIJAYALAKSHMI	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELS02	MODERN ELECTRONIC MEASUREMENTS AND INSTRUMENTS	SEC - II	IV	4	2	2	-	2

Objective	To make the Students to learn about the principle of various transducers, measuring techniques, and measuring instruments like meters, CRO.

Unit	Course Content	Knowledge Levels	Sessions
I	**Electro mechanical indicating instruments:** DC Ammeter - DC Voltmeter - Voltmeter Sensitivity - AC Voltmeter - Considerations in Analog Voltmeter - Series & Shunt Type Ohmmeter - Calibration of DC Instruments – Study of a Typical Digital Multimeter.	K1-K2	8
II	**Measuring Bridges:** Wheatstone Bridge - Balance Equation of General AC Bridges – Capacitance & Inductance Comparison Bridge - Maxwell - Hay - Schering - Wien - Kelvin & Kelvin's Double Bridge .	K3	10
III	**Cathode Ray Oscilloscope:** Block diagram - CRT - Vertical Deflection System - Delay line - Horizontal Deflection System - CRT screens & Graticules - Oscilloscope Probes - Measurement of Frequency, Amplitude & Phase - Lissajou's Patterns. Protocols.	K3-K4	8
IV	**Signal Genetrators:** Sample & Hold Circuit - Instrumentation Amplifier - Function Generator - Pulse Generator - Q Meter - Vector Impedance Meter - Wave Analyzer - Harmonic Distortion Analyzer .	K3	10
V	**Transducers:** Resistive Transducers – Inductive Transducers - Capacitive Transducers - Piezo Electric Transducer - Thermo Electric Transducers – Temperature Transducers – Microphones & Loud Speakers.	K3-K4	9
Course Outcome	**CO1:** Remember and understand the various measurement techniques and instruments.		K1
	CO2: Determine the performance of various measuring bridges.		K2
	CO3: Demonstrate and perform the various measurements using CRO.		K3
	CO4: Determine the functionality of signal generators.		K3
	CO5: Analyze performance of various sensors and signal conditioning elements.		K4

Learning Resources

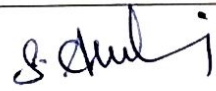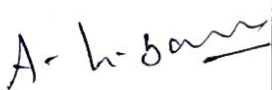| Text Books	1. Cooper, "Modern Electronic Instrumentation & Measurement Techniques" - PHI. 2. Electronic Instrumentation - H.S. Kalsi - TMH.
Reference Books	1. J.B.GUPTA,‖ A Course In Electronic and Electrical Measurements and Instrumentation", 12th Edition, S.K Kataria & Sons. 2. A.K. Sawhney,‖ ELECTRICAL & ELECTRONIC MEASUREMENTS AND INSTRUMENTATION:, Dhanpath Rai & Co (P) Ltd, 2004.
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee112/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELS02	Modern Electronic Measurements and Instruments	SBEC-II	IV	4	2	2	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	M	L	M	M	M	M	M
CO2	M	L	L	M	L	M	M	M	M	M
CO3	M	M	L	M	M	M	M	M	M	M
CO4	M	M	L	M	M	M	M	M	S	M
CO5	M	S	L	M	M	M	S	M	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MRS. P. VIJAYALAKSHMI	MR.S.ARULMANI	

| B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards |||||||||||

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELP03	PRACTICAL: COMMUNICATION SYSTEMS	DSC PRACTICAL-III	IV	3	-	~~1~~	~~2~~ 3	2
Objective	To Impart the students in design and Analysis of a various Communication Circuits.								

S.No.	List of Experiments / Programmes (Any 10)	Knowledge Levels	Sessions
1	Design a K - Low Pass Filter	K5	3
2	Design a K - High Pass Filter	K5	3
3	Amplitude Modulation and Demodulation	K4	3
4	Frequency Modulation and Demodulation	K4	3
5	PAM generation and detection	K4	3
6	PWM generation and detection	K4	3
7	PPM generation and detection	K4	3
8	PCM Generation and Detection	K4	3
9	Pre-Emphasis and De-Emphasis	K4	3
10	Generation of ASK and FSK	K4	3
11	Study of transmission medium.	K1-K2	3
12	Study of AGC Circuits	K1-K2	3
13	Study of Radio receiver	K1-K2	3
14	Study of TV Receiver.	K1-K2	3
15	Installation and Alignment of DTH Receiver	K5	3

Course Outcome	CO1: Understand the radio and TV Receivers.	K1
	CO2: Design and analyze filter for communication devices.	K3
	CO3: Demonstrate and Analyze the different Modulators and Detectors	K3
	CO4: Design and analysis of Pulse modulators and detectors.	K4
	CO5: Build and align a DTH receiver	K5

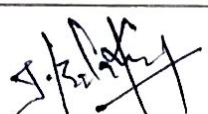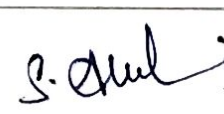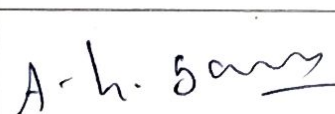| Learning Resources	
Text Books	S. Poorna Chandra, B. Sasikala, "Electronics Laboratory Primer", S. Chand and Company, 2005
Reference Books	K A Navas - " Electronics Lab Manual- Volume-II" - 6th Edition - PHI Learning Pvt.Ltd., New Delhi.
Website Link	https://www.youtube.com/watch?v=E5evBWUI9zl

L-Lecture, T-Tutorial, C-Credit

Course Code	Course Title		Course Type	Sem	Hours	L	T	P	C
21M4UELP03	PRACTICAL: COMMUNICATION SYSTEMS		DSC PRACTICAL-III	IV	3	-	1	2	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	L	M	M	L	M	L	M
CO2	S	M	L	M	L	M	L	M	L	M
CO3	M	M	L	M	L	M	L	M	M	M
CO4	M	M	L	M	M	M	M	M	L	M
CO5	M	M	L	M	M	M	M	M	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Practical in Laboratory
Teaching and Learning Methods	Laboratory Equipments
Assessment Methods	Observation of Records, Model Practical

Designed By	Verified By	Approved By
MR. BALAKRISHNAN	Mr.S. ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELA01	PRINCIPLES OF ELECTRONICS - I	GEC THEORY- I	III	5	4	1	-	4

Objective	To know about basic principle of Semiconductor Components, Circuit laws and theorems and also to know the various electronic circuits and their design.

Unit	Course Content	Knowledge Levels	Sessions
I	**Semiconductor theory:** Atomic Structure - Energy band - Semiconductor - Classification of Semiconductor - Theory of PN Junction Diode - Zener Diode - Avalanche Breakdown - Zener Break Down - Zener diode as voltage regulator - Operation of PNP & NPN Transistor - CB, CE, CC Configuration and Characteristics - Transistor as an Amplifier.	K1-K2	12
II	**Active and Passive Components:** Passive components: Resistors - Capacitors - Inductors - Resistors in series, resistors in parallel - capacitors in series - capacitors in parallel - inductors in series and inductors in parallel - energy stored in a capacitor - energy stored in an inductor. Active Components: JFET, MOSFET, UJT, LED working and characteristics (Simple theory only)	K1	12
III	**Circuits Laws and Theorems:** Ohms Law - Kirchoff's Voltage Law, Kirchoff's Current Law -Voltage division - current division - series circuits - parallel circuits - open circuits - closed circuits - Thevenin's theorem - Norton's theorem - Super passion theorem - Maximum power transfer theorem.	K1-K2	12
IV	**Rectifiers and power supply:** Rectifier - Half wave rectifier - full wave rectifier - bridge rectifier - ripple factor - percentage of efficiency - form factor - peak factor - PIV - compression - filters - C, L, L section, π section filters - regulators - 78XX and 79XX IC regulators - Dual regulated power supply design using IC regulators.	K2	12
V	**Amplifier and Oscillators:** Amplifiers: Definition - feedbacks - effect of negative feedback in amplifiers - Common emitter amplifier - Multistage amplifiers - RC Coupled amplifiers - Transformer coupled amplifier - Direct coupled amplifier - frequency response. Oscillator: Condition for Oscillation - Barkhausen criterion - Types of Oscillators - Hartley oscillator - Colpitt's oscillator - Crystal oscillator - RC phase shift oscillator - Astable Multivibrator - Mono stable Multivibrator - bistable multivibrator - Schimit trigger - UJT Relaxation oscillator.	K1-K2	12

Course Outcome			
	CO1:	Recite and understand about semiconductors diodes and its applications.	K1
	CO2:	Calculate the various parameters of a signal using different kinds of instruments.	K2
Course Outcome	CO3:	Illustrate the operations of various electronic circuits and their applications.	K3
	CO4:	Analyze the problems on circuits and troubleshoot.	K4
	CO5:	Design power supplies, amplifier and Oscillator circuits.	K5

Learning Resources	
Text Books	1. V.K. Metha, Rohit Metha - Principles of Electronics-S.Chand 12th edition 2. R.S Sedha –A Textbook of Applied Electronics - Revised Edition – 2008. 3. A. Sudhakar, Shyammohan S. Palli -Circuits and Networks: Analysis and Synthesis - 5th Edition 2017
Reference Books	1. S. Salivahanan, N. SureshKumar-Electronic Devices and Circuits –4th Edi -2017 2. Isaak D. Mayergoyz, W. Lawson - Basic Electric Circuit Theory
Website Link	https://www.electronics-tutorials.ws/ https://www.electronics-tutorials.ws/diode/diode_1.html https://www.allaboutcircuits.com/textbook/semiconductors/chpt-1/amplifiers/

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELA01	PRINCIPLES OF ELECTRONICS - I	GEC THEORY- I	III	5	4	1	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	M	M	S	M
CO2	S	S	M	M	L	M	L	L	L	L
CO3	M	S	M	S	L	L	L	S	M	S
CO4	S	M	S	L	M	M	S	M	L	M
CO5	M	M	M	L	M	M	M	L	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG	
Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. I. BALAKRISHNAN	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C	
21M4UELA03	PRINCIPLES OF ELECTRONICS - II	GEC THEORY- II	IV	5	4	1	-	4	

Objective	To provide the fundamental concepts associated with the digital logic and circuit design and to introduce the basic concepts and laws involved in the Boolean algebra, logic families and digital circuits. Students to study circuits and make the practical possible application of circuits in day to day life.		
Unit	Course Content	Knowledge Levels	Sessions
I	**Digital Principles:** Number systems - conversion of number from one base to another - Boolean Algebra - Demorgan's theorem - Simplification of Boolean function - K-Map (up to 4 variables) - Logic gates - Universal gates - BCD - Excess 3 code - gray Code - ASCII code - 1's Compliment - 2's Compliment - Design of Logic circuits.	K1-K2	12
II	**Combinational and Sequential Circuits:** Combinational Circuits: Half adder - Full adder - half subtractor - Full subtractor - binary comparator - encoder - decoder - multiplexer - de multiplexer - parity generator checker. Sequential Circuits: Flip Flops - RS - JK - D - T flip flops - shift registers - SISO -SIPO -PIPO -PISO - Design of Modulo Counter.	K1-K2	12
III	**Linear ICs and their applications:** OpAmp: pin details of 741 - Ideal OpAmp - OpAmp Stages - OpAmp parameters - inverting and non inverting amplifiers - Adder and Subtractor - Multiplier and Divider - Differentiator - integrator - V to I and I to V converter - sample and hold circuit - Instrumentation amplifier. IC555 Timer: Pin details of IC 555 - Block Diagram - Astable multivibrator - Mono stable multivibrator - Bistable Multivibrator.	K1-K2	12
IV	**Transducers and Measuring instruments:** Transducers: Resistive transducer - Capacitive transducer - Inductive transducers - Piezo electric transducer - Thermoelectric transducers - LM35 - LVDT - Strain gauge - Selection of transducers. Measuring Instruments: Introduction to PMMC instruments - DC Voltmeter - DC Ammeter - DMM - Wheatstone Bridge - Maxwell - Wien - Kelvin Bridge - CRO - Block diagram - CRT - Applications.	K2	12
V	**Communication Systems:** Modulation -- Need For Modulation - Amplitude Modulation and Detection - Frequency Modulation and Detection - AM Transmitters - AM Receivers - FM Transmitter - FM Receiver - Modulation and Detection of : PAM - PWM- PPM - PCM -sampling - sampling theorem - quantization - Companding.	K1-K2	12

Course Outcome	CO1: Recognize and summarize the various digital system design principles.	K1
	CO2: Illustrate the operation and uses of linear ICs.	K3
	CO3: Classify the various kinds of transducers and their applications.	K4
	CO4: Analyze the circuits and measure various electrical parameters using basic instruments.	K4
	CO5: Categorize the principles of electronic communications Systems	K4

Learning Resources

Text Books	1. S. Salivahanan, N. SureshKumar -Electronic Devices and Circuits - 4th Edi -2017 2. V.K. Mehta -Principles of Electronics- S. Chand. 3. Roy Choudhury -Linear Integrated Circuits- 5th Edition -NAI Piblishers - 2018. 4. George Kennedy - Electronic Communication Systems - TMH - IV Edition.
Reference Books	1. S.L. Kakani, K.C. BhanDai - A Text Book of Electronics 2. Albert.D.Helfric, William.D. Cooper - Modern electronic Instrumentation and Measurement Techniques-2015
Website Link	https://www.electronics-tutorials.ws/logic/logic_1.html https://www.tutorialspoint.com/electronic_measuring_instruments/electronic_measuring_instruments_passive_transducers.htm

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P.	C
21M4UELA03	PRINCIPLES OF ELECTRONICS - II	GEC THEORY- II	IV	5	4	1	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	M	M	S	M
CO2	S	S	M	M	M	M	L	L	L	L
CO3	S	M	M	M	M	L	L	S	M	S
CO4	S	M	S	M	M	M	S	M	L	M
CO5	M	M	M	L	L	M	M	L	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG	
Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR.I. BALAKRISHNAN	MR.S.ARULMANI	

MCAS Autonomous Rasipuram — Curriculum Development Cell

Allied Course for any Degree offered by the B.Sc.,Electronics & Communication
LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards
LIST OF GEC - ALLIED COURSES

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	III	21M3UELA01	PRINCIPLES OF ELECTRONICS - I
2	III	21M3UELA02	APPLIED ELECTRONICS - I
3	IV	21M4UELA03	PRINCIPLES OF ELECTRONICS - II
4	IV	21M4UELA04	APPLIED ELECTRONICS - II
5	IV	21M4UELAP01	PRACTICAL: PRINCIPLES OF ELECTRONICS
6	IV	21M4UELAP02	PRACTICAL: APPLIED ELECTRONICS

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELAP01	PRACTICAL: PRINCIPLES OF ELECTRONICS	GEC PRACTICAL - I	IV	3	-	1	2	2

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Objective	To Impart the students in analysis and design of various Laws, Analog and Digital Circuits.

S.No.	List of Experiments (Any 22)	Knowledge Levels	Sessions
1	Colour Coding of Resistors.	K1-K2	3
2	Verification of Ohm's Law.	K4	3
3	Verification of Kirchoff's Current Law.	K4	3
4	Verification of Kirchoff's Voltage Law.	K4	3
5	Amplitude and Frequency and measurement using CRO.	K2	3
6	VI Characteristics of PN Junction Diode.	K3	3
7	Verification of Input characteristics of CE Transistor.	K3	3
8	Verification of Output Characteristics of CE Transistor.	K3	3
9	Half wave rectifier with and without capacitor filter.	K4	3
10	Full wave rectifier with and without capacitor filter.	K4	3
11	Bridge rectifier with and without capacitor filter.	K4	3
12	Design of Dual IC RPS using 78XX and 79XX ICs	K6	3
13	Truth Table Verification of Logic Gates.	K4	3
14	Implementation of NAND gate as universal gate.	K4	3
15	Implementation of NOR gate as universal gate.	K4	3
16	Verification of De-Morgan's Theorem.	K4	3
17	Boolean function simplification and verification using K-Map	K4	3
18	Verification of Half Adder & Full Adder.	K3	3
19	Verification of Half Subtractor & Full Subtractor.	K3	3
20	Encoder Using 74147 IC.	K5	3
21	Decoder Using 7442 IC.	K5	3
22	Multiplexer Using 74153 IC.	K5	3
23	De-multiplexer Using 74155 IC.	K5	3
24	JK-MS Flip Flop Using 7476 IC.	K5	3
25	Inverting amplifier using IC741.	K5	3
26	Non inverting amplifier using IC 741	K5	3
27	Design of Differentiator using IC 741.	K5	3
28	Design of Integrator using IC 741.	K5	3
29	Astable Multivibrator using IC 555 Timer.	K5	3
30	Mono stable Multivibrator using IC 555 Timer.	K5	3

Course Outcome	CO1: Recall the colour coding of resister, measurement of voltage, current and frequency.		K1
	CO2: Simplify the complex circuits to small circuits using various laws and theorems		K4
	CO3: Design and Evaluate the operations of various gates and Combinational Logic circuits.		K5
	CO4: Evaluate and Justify the working of Various linear and Digital ICs		K5
	CO5: Build the DC regulated power supply.		K6

Learning Resources

Text Books	1. K A Navas - " Electronics Lab Manual- Volume-I " - 6th Edition - PHI Learning Pvt.Ltd., New Delhi.
Reference Books	1. A. M. Zungeru, J. M. Chuma, M. Mangwala, H. U. Ezea," Handbook of Laboratory Experiments in Electronics Engineering Volume 1" Notion Press, Incorporated, 2016
Website Link	http://vlabs.iitkgp.ernet.in/be/# http://vlabs.iitkgp.ac.in/dec/#

L-Lecture, T-Tutorial, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELAP01	PRACTICAL: PRINCIPLES OF ELECTRONICS	GEC PRACTICAL - I	IV	3	-	1	2	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	S	S	S	S	S	M	S
CO2	M	M	L	S	M	S	S	S	M	S
CO3	M	M	L	S	M	M	S	S	S	S
CO4	M	M	L	M	M	L	M	M	M	S
CO5	M	S	L	S	M	S	S	S	M	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Practical in Laboratory
Teaching and Learning Methods	Laboratory Equipments
Assessment Methods	Observation of Records, Model Practical

Designed By	Verified By	Approved By
MR.I. BALAKRISHNAN	Mr.S. ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELA02	APPLIED ELECTRONICS - I	GEC THEORY- I	III	5	4	1	-	4
Objective	To give knowledge about semiconductor physics and discuss working and applications of basic devices and to learn about waveform generator circuits and its types.								
Unit	Course Content					Knowledge Levels		Sessions	
I	**Semiconductor Theory:** Introduction to Semiconductor - Intrinsic Semiconductor - Extrinsic Semiconductor - Theory of PN Junction diode - Zener Diode - Avalanche Breakdown - Zener Break down - Operation of PNP & NPN Transistor - CB , CE , CC Configuration and Characteristics - Transistor as an Amplifier.					K1		12	
II	**Resistors, Capacitors, Inductors:** Resistors, Capacitors & Inductors in Series and Parallel - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor - Ohm's Law - Kirchoff's Current Law - Kirchoff's Voltage Law - Voltage Division - Current Division - Series Circuits - Parallel Circuits - Series & Parallel Circuits - Open Circuit - Short Circuit.					K1-K2		12	
III	**Power Supply:** Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Capacitor Filter - Fixed IC Regulated Power Supply using 78XX - Dual IC Regulated Power Supply using 78XX & 79XX.					K1-K3		12	
IV	**Waveforms:** Sinusoidal Waveform - Non-Sinusoidal Waveform - Peak Value - Peak to Peak Value - Average Value - RMS Value - Period & Frequency Measurement – Use of Digital Multimeter - Use of CRO.					K3		12	
V	**Sinusoidal & Non Sinusoidal Oscillators:** Classification of Oscillators - Barkhausen Criterion - Hartley Oscillator - Colpitt Oscillator – RC Phase Shift Oscillator - Wein Bridge - Crystal Oscillator - Frequency stability of Oscillators - Astable Multivibrator - Monostable Multivibrator, Bi Stable Multivibrator – Schmit trigger.					K1-K3		12	
Course Outcome	**CO1:** Recite and understand about semiconductors diodes and its applications.							K1	
	CO2: Calculate the various parameters of a signal using different kinds of instruments.							K2	
	CO3: Illustrate the operations of various electronic circuits and their applications.							K3	
	CO4: Analyze the problems on circuits and troubleshoot.							K4	
	CO5: Design power supplies, amplifier and Oscillator circuits.							K5	

Learning Resources

Text Books	1. V.K. Metha, Rohit Metha - Principles of Electronics-S.Chand 12th edition 2. R.S Sedha -A Textbook of Applied Electronics - Revised Edition - 2008. 3. A. Sudhakar, Shyammohan S. Palli -Circuits and Networks: Analysis and Synthesis - 5th Edition 2017
Reference Books	1. S. Salivahanan, N. SureshKumar-Electronic Devices and Circuits -4th Edi -2017 2. Isaak D. Mayergoyz, W. Lawson - Basic Electric Circuit Theory
Website Link	https://www.electronics-tutorials.ws/ https://www.electronics-tutorials.ws/diode/diode_1.html https://www.allaboutcircuits.com/textbook/semiconductors/chpt-1/amplifiers/

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELA02	APPLIED ELECTRONICS - I	GEC THEORY- I	III	5	4	1	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	M	M	S	M
CO2	S	S	S	M	M	M	L	L	L	L
CO3	S	M	S	M	M	L	L	S	M	S
CO4	S	M	M	M	M	M	S	M	L	M
CO5	M	M	M	L	L	M	M	L	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. S. SATHISHKUMAR	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELA04	APPLIED ELECTRONICS - II	GEC THEORY- II	IV	5	4	1	-	4
Objective	Students can understand, how a silicon wafer is turned into an operating integrated circuit, Mathematical operations of op-amp 741,Digital Logic gates functions with truth tables, transducers types and operations, fundamentals of electronics communication systems							
Unit	Course Content			Knowledge Levels		Sessions		
I	**IC Fabrication :** Introduction of IC and its Types -IC Integration Density & Its Types -Fundamentals of Monolithic IC technology-Basic Planar Process - Fabrication of Active and passive components - Fabrication of FET, MOSFET - CMOS - Thin and Thick film technology.			K1-K2		12		
II	**OP-Amp:** Introduction to Operational Amplifier - Op Amp Parameters - Op Amp Stages - Inverting Amplifier - Non Inverting Amplifier - Adder - Subtractor - Multiplier - Divider - Integrator - Differentiator - V to I Converter - I to V Converter-Log and Antilog Amplifier - Voltage Follower-Sign Changer-Scale Changer.			K1-K2		12		
III	**Digital logics:** Basic Gates: AND - OR - NOT - NAND as Universal Gates - NOR as Universal Gates - Half and Full Adder - Half and Full Subtractor - Encoder - Decoder - Multiplexer -Demultiplexer.			K1		12		
IV	**Transducers:** Piezo Electric Transducer - Resistive Transducer Capacitive Transducer-Inductive Transducer-Thermocouples Transducer - LVDT- Strain Gauge Transducer - Temperature Transducer- Microphone & Loud Speaker.			K1		12		
V	**Communication Systems:** Need for Modulation -Amplitude Modulation-Frequency Modulation-AM Transmitter-FM Transmitter-AM Receiver-FM Receiver-Sampling Theorem-Pulse Code Modulation & Detection - PAM-PPM - PWM.			K1-K2		12		
Course Outcome	**CO1:** Recognize and summarize the various IC fabrication techniques.					K1		
	CO2: Understand and Illustrate the operation and uses of digital and linear Integrated circuits.					K2		
	CO3: Classify the various kinds of transducers and their applications.					K3		
	CO4: Analyze the circuits and measure various electrical parameters using basic instruments.					K4		
	CO5: Categorize the principles of electronic communications Systems.					K4		

Learning Resources

Text Books	1. S. Salivahanan, N. SureshKumar -Electronic Devices and Circuits - 4th Edi -2017 2. V.K. Mehta -Principles of Electronics- S. Chand. 3. Roy Choudhury -Linear Integrated Circuits- 5th Edition -NAI Piblishers - 2018. 4. George Kennedy - Electronic Communication Systems - TMH - IV Edition.
Reference Books	1. S.L. Kakani, K.C. BhanDai - A Text Book of Electronics 2. Albert.D.Helfric, William.D. Cooper - Modern electronic Instrumentation and Measurement Techniques-2015
Website Link	https://www.electronics-tutorials.ws/logic/logic_1.html https://www.tutorialspoint.com/electronic_measuring_instruments/electronic_measuring_instruments_passive_transducers.htm https://electronicspost.com/block-diagram-of-communication-system-with-detailed-explanation/

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELA04	APPLIED ELECTRONICS - II	GEC THEORY- II	IV	5	4	1	-	4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	M	M	S	M
CO2	S	S	M	M	M	M	L	L	L	L
CO3	S	M	S	L	M	L	L	S	M	S
CO4	M	M	M	M	M	M	S	M	L	M
CO5	M	M	M	L	L	M	M	L	S	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. SATHISHKUMAR	MR.S.ARULMANI	

Curriculum Development Cell MCAS Autonomous Rasipuram

	B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELAP02	PRACTICAL: APPLIED ELECTRONICS	GEC PRACTICAL - I	IV	3	-	1	2	2

Objective	To Impart the students in analysis and design of various Laws, Analog and Digital Circuits.

S.No.	List of Experiments (Any 22)	Knowledge Levels	Sessions
1	Colour Coding of Resistors.	K1-K2	3
2	PN Junction Diode Characteristics	K4	3
3	CE Input Characteristics	K4	3
4	CE Output Characteristics	K4	3
5	Verification of Ohm's Law	K2	3
6	Verification of KVL and KCL	K3	3
7	Measurement of Amplitude & Frequency Using CRO.	K3	3
8	Truth Table Verification of BASIC Gates	K3	3
9	NAND as a UNIVERSAL GATE (AND / OR /NOT)	K4	3
10	NOR as a UNIVERSAL GATE (AND /OR /NOT)	K4	3
11	Verification of De Morgan's Theorem.	K4	3
12	Half Adder / Full Adder	K6	3
13	Half Subtractor / Full Subtractor.	K4	3
14	Encoder Using 74147 IC	K4	3
15	Decoder Using 7442 IC	K4	3
16	Multiplexer Using 74153 IC	K4	3
17	Demultiplexer Using 74155 IC	K4	3
18	Half Wave Rectifier with Capacitor Filter	K3	3
19	Full Wave Rectifier with Capacitor Filter	K3	3
20	Bridge Rectifier with Capacitor Filter	K5	3
21	+5V Regulated Power Supply Uning 7805 IC	K5	3
22	Dual IC Regulated Power Supply (78XX & 79XX).	K5	3
23	Inverting Amplifier using 741	K5	3
24	Non Inverting Amplifier using 741	K5	3
25	Inverting Adder Using Op-Amp	K5	3
26	Non-Inverting Adder Using Op-Amp	K5	3
27	Differentiator using Op-Amp	K5	3
28	Integrator using Op-Amp	K5	3
29	Subtractor Using Op-Amp	K5	3
30	Wave form generator using Op-Amp	K5	3

	CO1: Recall the colour coding of resister, measurement of voltage, current and frequency.	K1
Course Outcome	CO2: Simplify the complex circuits to small circuits using various laws and theorems	K4
	CO3: Design and Evaluate the operations of various gates and Combinational Logic circuits.	K5
	CO4: Evaluate and Justify the working of Various linear and Digital ICs	K5
	CO5: Build the DC regulated power supply.	K6

Learning Resources

Text Books	1. K A Navas - " Electronics Lab Manual- Volume-I " - 6th Edition - PHI Learning Pvt.Ltd., New Delhi.
Reference Books	1. A. M. Zungeru, J. M. Chuma, M. Mangwala, H. U. Ezea," Handbook of Laboratory Experiments in Electronics Engineering Vol. 1, Volume 1" Notion Press, Incorporated, 2016
Website Link	http://vlabs.iitkgp.ernet.in/be/# http://vlabs.iitkgp.ac.in/dec/#

L-Lecture, T-Tutorial, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELAP02	PRACTICAL: APPLIED ELECTRONICS	GEC PRACTICAL - I	IV	3	-	1	2	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	S	S	S	S	S	M	S
CO2	M	M	L	S	M	S	S	S	M	S
CO3	M	M	L	S	M	M	S	S	S	S
CO4	M	M	L	M	M	L	M	M	M	S
CO5	M	S	L	S	M	S	S	S	M	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG	
Tutorial Schedule	Practical in Laboratory
Teaching and Learning Methods	Laboratory Equipments
Assessment Methods	Observation of Records, Model Practical

Designed By	Verified By	Approved By
MR. S.SATHISHKUMAR	Mr.S. ARULMANI	

List of Non Major Elective Course (NMEC) offered by the
B.Sc.,Electronics & Communication
SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022 Onwards

S.No.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	III	21M3UELN01	CELLULAR PHONES
2	III	21M3UELN02	BIO MEDICAL INSTRUMENTATION
3	III	21M3UELN03	ELECTRICAL AND ELECTRONIC APPLIANCES MAINTENANCE AND SERVICING
4	III	21M3UELN04	ROBOTICS
5	IV	21M4UELN05	SATILLITE AND CABLE TV
6	IV	21M4UELN06	IOT AND ARDUINO
7	IV	21M4UELN07	ARTIFICIAL INTELLIGENCE

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELN01	CELLULAR PHONES	NMEC - I	III	2	2	-	-	2

Objective	To make the students understand the Cellular phone concept with various accessing technology and also to know the flashing software, various parts of Cellular phone.

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of Communication:** Overview of Analog, Digital, and Data Communications: History- Generation of cell phones - Mobile Frequencies - Cellular frequency band system - Frequency for Radio Transmission -Signals - Wave Propagation - Antennas.	K1-K2	3
II	**Cellular System:** Cellular telephone- fundamental concepts - Simplified Cellular telephone system - frequency reuse - Interference - Co-channel Interference - Adjacent Channel Interference - Improving coverage and capacity in cellular systems - cell splitting - sectoring - Roaming and Handoff - Basics of blue tooth technology.	K2	3
III	**Multiple Access Techniques:** TDMA, FDMA, CDMA. Digital cellular system - Global system for mobile communications (GSM) -GSM services - GSM System Architecture - Basics of GPRS.	K2-K3	3
IV	**Cell phone Hardware and Software:** Hardware/Software Repairing - Various Locks - Ultrasonic Cleaner - Computer Connectors - SIM Card Reader - Memory Card Reader - Mobile Virus - Virus Prevention - Removing Virus - Health Hazards with Mobiles - SAR	K4-K5	3
V	**Drivers and security:** Installation of UFS Driver, UFS Suite & Flashing Files - IMEI Number Detection - Mobile GSM Utility Codes (Any Five of Nokia Set)	K3-K4	3

	CO1: Identify the various wireless communication principles and cellular concepts.	K1
	CO2: Restate the multiplexing techniques over cellular communication.	K2
Course Outcome	CO3: Illustrate and use the various mobile security protocols.	K3
	CO4: Categorize the different parts cell phone and their Performances.	K4
	CO5: Analyze and troubleshoot the problems on both software and hardware.	K5

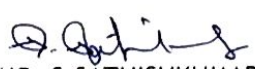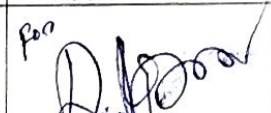| Learning Resources	
Text Books	1. Mobile Communication- Jochen Schiller- Person Education Ltd. 2. Modern Mobile Phone Repair: Using Computer Software and Service Devices- M.Lotia,Pradeep Nair- BPB Publications.
Reference Books	1. Modern Mobile Phone Introduction & Servicing- Manahar Lotia - BPB Publications. 2. Satellite communication- Dr.D.C.Agarwal -Third Edition-Khanna publishers 95. 3. Electronic Communications systems - Fundamentals through Advanced - Wayne Tomasi - Fifth Edition - Pearson Education - 2005
Website Link	https://onlinecourses.nptel.ac.in/noc22_ee85/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title		Course Type	Sem	Hours	L	T	P	C
21M3UELN01	CELLULAR PHONES		NMEC-I	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	L	M	M	M	M	L
CO2	M	L	L	L	L	M	S	M	S	L
CO3	M	M	L	M	L	L	M	L	L	M
CO4	M	S	L	M	S	M	L	L	M	M
CO5	M	S	L	M	S	S	S	L	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. S.SATHISHKUMAR	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C	
21M3UELN02	BIOMEDICAL INSTRUMENTATION	NMEC - I	III	2	2	-	-	2	

Objective	To enable the students to learn about the various kinds bio-potentials generated by the human organs and the working principles of medical instruments.

Unit	Course Content	Knowledge Levels	Sessions
I	**Human physiological systems:** Introduction – Cells and their structure- Nature of cancer cells - Transport of Ions through the cell membrane-Resting and Action potentials – Characteristics of Resting potential- Bio electric potentials-Nerve tissues and organs- Different systems of human body.	K1-K2	3
II	**Bio potential measurements:** Bio signal characteristics-Frequency and Amplitude ranges -ECG – EMG – EEG-ERG – EOG	K3	3
III	**Physiological assist Devices:** Introduction-Pacemakers – Energy requirements to excite heart muscle-Methods of simulation -Different modes of operation-Pacemaker Batteries -Artificial Heart valves-Defibrillators-Different types of Defibrillators-Heart-Lung machine.	K2-K3	3
IV	**Specialized medical Equipment:** Blood cell counter-Electron microscope - Scanning Electron Microscope (SEM)-Radiation Detectors-Photometers and Colorimeters-Filter photometer-Spectrophotometer-Flame photometer-Filter fluoro meter - Chromatography -Digital Thermometer.	K4	3
V	**Signal conditioning circuits:** Need for Bio- amplifier-Single ended Bio-amplifier - Differential Bio-amplifier-Impedance matching circuit-Isolation amplifiers- Transformer and optical isolation Isolated DC amplifier and AC carrier amplifier	K3	3

Course Outcome	**CO1:** Remember the human physiological systems and bio potentials.	K1
	CO2: Understand the various sensors used for measuring the bio potential by which identify the problems.	K2
	CO3: Calculate the temperature, pH level, blood cell counts, BP, Heart rate, using instruments	K3
	CO4: Categorize and understand the various handouts of ECG,EEG output charts	K4
	CO5: Analyze the medical reports using the knowledge gained	K4

Learning Resources	
Text Books	1. R.S.KHANDPUR- Handbook of Biomedical Instrumentation - TATA McGraw Hill publishing company Limited 2. M.ARUMUGAM-Bio Medical Instrumentation- Anuradha Agencies-2003
Reference Books	1. LESLIE CROMWELL, FRED J.WEIBELL and ERICH A.PFEIFFER- Bio medical Instrumentation and Measurements-Second Edition - Prentice-Hall of India 2. Bhuvaneshwari-Bio medical Instrumentations- Anuradha Publications.
Website Link	https://www.edx.org/course/biomedical-equipment-technician-training-maintenance-repair?index=product&queryID=c4235433df825a23a8813ac5bdfdbe41&position=1&linked_from=autocomplete

L-Lecture, T-Tutorial, P-Practical, C-Credit

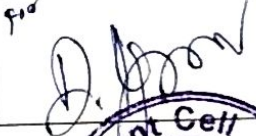| Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELN02	BIOMEDICAL INSTRUMENTATION	NMEC-I	III	2	2	-	-	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	L	L	L	M	M	M	M
CO2	L	S	L	M	M	M	M	L	S	M
CO3	M	M	L	M	M	M	S	M	M	S
CO4	M	M	L	M	M	L	M	M	M	M
CO5	M	M	L	M	M	S	M	M	S	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MRS.P.VIJAYALAKSHMI	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELN03	ELECTRICAL AND ELECTRONIC APPLIANCES MAINTENANCE AND SERVICING	NMEC - I	III	2	2	-	-	2

Objective	To make the students learn the key elements of electrical and electronics appliances and to understand domestic wiring and layout with safety precautions.

Unit	Course Content	Knowledge Levels	Sessions
I	**Electronic Components:** Components - Resistors - Condensers - Resistance Value - Capacitor Value - Diodes - transistors - IC's - Transformers and their classification.	K1	3
II	**Electrical Appliances:** Electrical Bulbs - Florescent Lamps - Inverter - Basic of UPS - Stabilizers - Voltage regulators - Iron Box - Heaters - Electrical Oven - Wet Grinder - Mixer - Refrigerators - Air Conditioners - Freezers - Washing Machines.	K2-K3	3
III	**Electronic Appliances:** Basics of Radio - TV - CD Players - LCD Projectors - Digital Camera - Scanners - Video Conferencing.	K3	3
IV	**Computers:** Block diagram of a Computer - Input Device - Memory Device - Control Unit - Arithmetic logic unit - Output device - Microprocessor - RAM - ROM.	K4	3
V	**Communication Electronics:** Basics of Telephones - Mobile Phones - Wireless Phones - Antenna - Internet - Satellites.	K3	3
Course Outcome	**CO1:** Recognize the performance of various basic electrical and Electronic Components.	K1	
	CO2: Familiarize the principle behind the electrical and electronic appliance's operation.	K2	
	CO3: Predict the problems in the home appliances.	K3	
	CO4: Illustrate and Demonstrate the hardware and software installation of computers.	K3	
	CO5: Analyze and troubleshoot the appliances using basic instruments.	K4	

Learning Resources		
Text Books	1. Handbook of Repair and Maintenance Of Domestic Electronics Appliances handbook- Sinha Shashi Bhushan-BPB
Reference Books	1. Electrical Appliances: The Complete Guide to the Maintenance and Repair of Domestic Electrical Appliances-Graham Dixom - Haynes Manuals Inc
Website Link	https://onlinecourses.swayam2.ac.in/nou22_ec03/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELN03	ELECTRICAL AND ELECTRONIC APPLIANCES MAINTENANCE AND SERVICING	NMEC-I	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	M	M	M	M	M	M	L
CO2	M	M	L	M	S	M	S	M	S	L
CO3	M	M	L	M	S	L	M	L	L	M
CO4	M	M	L	M	S	M	L	L	M	M
CO5	M	M	L	M	M	S	S	L	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
DR.M. KUTRALEESWARAN	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M3UELN04	ROBOTICS	NMEC - I	III	2	2	-	-	2

Objective	To familiarize the students with the applications of Robots and to know about the sensors, actuators used in Robot designing.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Robotics:** Robotics: Classification - Components - Characteristics - Applications	K1-K2	3
II	**Robotics Kinematics:** Position Analysis - Robots as Mechanisms - Matrix Representation - Transformation Matrices - Forward and Inverse Kinematics	K3	3
III	**Actuators:** Characteristics of Actuating Systems - Actuating Devices and Control	K2-K3	3
IV	**Sensors:** Sensor Characteristics, Description of Different Sensors, Vision Sensors, Force Sensors, Proximity Sensors, Tilt Sensors	K3-K4	3
V	**Robot controls:** Point to Point control - Continuous Path Control - Intelligent Robot - Control System for Robot Joint - Control Actions - Feedback Devices	K4	3

Course Outcome	CO1: Recall the principles of sensors and actuators.	K1
	CO2: Contrast the problems and requirements of industries.	K2
	CO3: Solve the problems both theoretically and practically using necessary mechanisms.	K3
	CO4: Illustrate the various control methods and devices used in robotics.	K4
	CO5: Analyze and represent the data used to solve a problem by robotic design.	K4

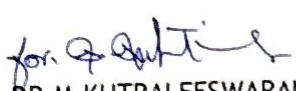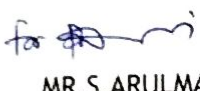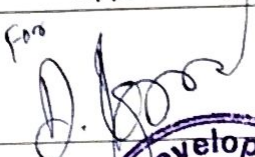|	Learning Resources
Text Books	1. Saeed B. Niku, Introduction to Robotics Analysis, Application, Pearson Education Asia, 2001 2. Mikell P Groover & Nicholas G Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta, Industrial Robotics, "Technology Programming and Applications", McGraw Hill, 2012. 3. Richard D. Klafter, Thomas .A, Chri Elewski, Michael Negin, "Robotics Engineering an Integrated Approach", Phi Learning., 2009. 4. Vijay Madisetti and Arshdeep Bahga, Internet of Things - A Hands-on Approach, First Edition, University Press, 2015.
Reference Books	1. R.K.Mittal and I J Nagrath, Robotics and Control, TMH, 2003. 2. Computational Intelligence, Davis Poole, Alan Mackwath, Randy Coehel, Oxford University Press 1998. 3. Industrial Robotics / Groover M P /McGraw Hill 4. Introduction to Robotics / John J. Craig/ Pearson
Website Link	https://www.edx.org/course/robotics-foundations-i-robot-modeling?index=product&queryID=556ac1a113d5bbd079a0ac458f69ec69&position=3&linked_from=autocomplete https://onlinecourses.nptel.ac.in/noc22_de11/preview

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title		Course Type	Sem	Hours	L	T	P	C
21M3UELN04	ROBOTICS		NMEC-I	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	L	L	M	M	L	M	M
CO2	L	M	L	M	L	M	S	L	M	S
CO3	M	L	L	M	M	L	L	M	L	M
CO4	M	M	L	L	M	L	M	M	M	L
CO5	M	M	L	M	M	L	M	M	S	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
DR.M.KUTRALEESWARAN	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELN05	SATELLITE AND CABLE TV	NMEC - II	IV	2	2	-	-	2

Objective	To know basics of satellite communication and expose the learners to the basics of Cable and DTH process.

Unit	Course Content	Knowledge Levels	Sessions
I	**Satellite Communication:** Introduction- Geostationary Satellites- Communication Satellites – Satellite Sub Systems- Earth Stations – International and Regional Satellites - Domestic Satellites	K1-K2	3
II	**Cable TV Channels and Signal Processing:** Introduction – Cable Channels - Cable Channel Allocations - Preferred Cable Channels ¬ Low Noise Block Converter - Power Divider (Splitter) - Video Cassette Recorder (VCR) - Combining Networks.	K2-K3	3
III	**Cable Signal Distribution:** Introduction – Signal Distribution Network - Cable Losses and Signal Distortion - Trunk and Distribution Amplifiers - Signal Splitters and Line Taps - Cable Signal Converters.	K3	3
IV	**Signal Encoding and Compression:** Introduction - Digital Television Signal Bandwidth – Video and Audio Signal Encoding -Data Compression Techniques - Data Stream Regulation - Video Compression Formats – Audio Compression Formats.	K4	3
V	**Direct-To-Home (DTH) Satellite Television:** Introduction - MAC Encoding of Television Signals - Program Material - Data Processing and Packetizing - Signal Up linking and Satellites – DTH Satellite Receiver – DTH Receiving Equipment -Consumer Guide to DTH Satellite system.	K3-K4	3
Course Outcome	CO1: Recite the knowledge about history and basics of satellites	K1	
	CO2: Contrast the principles of digital and satellite TV Network's transmission techniques.	K2	
	CO3: Interpret the various video processing techniques.	K2	
	CO4: Determine the concepts of signal encoding and Compression of digital data over TV transmission.	K3	
	CO5: Perform the DTH receiver installation.	K4	

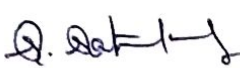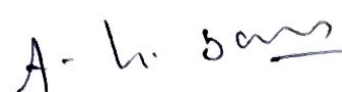| Learning Resources	
Text Books	1. R.R. Gulati - " Composite Satellite and Cable TV" -NAI. 2. Dennis Roddy - "Satellite Communication" -TMH
Reference Books	1. R.R. Gulati "Modern TV Practice" - NAI 2. Manohar Lotia- " Modern DTH Digital Satellite Receivers" - BPB
Website Link	https://www.coursera.org/learn/satellite-communications https://www.classcentral.com/course/satellitecommunications-6313

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELN05	SATELLITE AND CABLE TV	NMEC-II	IV	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	L	M	M	L	M	M
CO2	M	M	L	M	M	S	M	M	M	L
CO3	M	M	L	L	M	M	S	M	S	M
CO4	M	L	L	M	M	M	M	L	M	M
CO5	M	M	L	M	M	S	S	S	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. S.SATHISHKUMAR	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards								
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELN06	IOT AND ARDUINO	NMEC - II	IV	2	2	-	-	2
Objective	To enhance the student's knowledge among the new technology by learning about IoT technology by its architecture and protocols.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of IoT:** Introduction to IoT - Elements of an IoT eco system - Technology drivers - Business drivers - Trends and implications - Over view of Governance, privacy and security issues.	K1-K2	3
II	**IoT Architecture:** M2M high level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model - Domain model - Information model - Functional model - Communication model- IoT Reference architecture.	K3	3
III	**Arduino Basics:** Hardware requirements - Software requirements - Arduino programming language reference - Arduino code execution.	K2	3
IV	**Internet connectivity:** Arduino Uno wired connectivity - Software required - External libraries -Internet connectivity (Ethernet) - Standard functions - Arduino Uno Wireless connectivity - Hardware required - Software required - External libraries - Internet connectivity (Wireless) - Standard functions.	K4	3
V	**IoT Applications:** The semantic model - Software UX Design considerations - Machine learning and predictive analytics - Rapid application development.	K4	3

Course Outcome	CO1: Remember Web technology by which understands the principles of IoT technology.	K1
	CO2: Understand and Illustrate the principles of various sensors and actuators.	K2
	CO3: Demonstrate the usage of Arduino boards.	K3
	CO4: Categorize the problems and based on it choose the IoT architecture	K4
	CO5: Associate the IoT Security and Governance.	K4

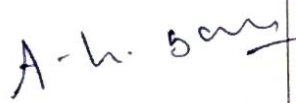| Learning Resources	
Text Books	1. Joe Biron and Jonathan follett - Foundational elements of an IoT Solution- O'Relly media Inc. 2. Adeel Javed - Building Arduino project for the Internet of Things -APress. 3. The internet of things in the cloud A middleware perspective - Honbo Zhou- CRC Press, 2012
Reference Books	1. Internet of things hands on approach Arshdeep bahga, Vijay madisetti - University press, 2015. 2. Architecting the internet of things Dieter Uckelmann, Mark Harrison, Michahelles, Florian Eds), - Springer-2011
Website Link	https://www.edx.org/course/introduction-to-the-internet-of-things-iot?index=product&queryID=c062292374c7a4d712c51aa5ef2ff77&position=3&linked_from=autocomplete

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title			Course Type	Sem	Hours	L	T	P	C
21M4UELN06	IOT WITH ARDUINO			NMEC-II	IV	2	2	-	-	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	M	M	M	M	L	M	M
CO2	M	M	L	M	M	M	S	L	M	S
CO3	M	M	L	M	S	L	L	M	L	M
CO4	M	S	L	M	S	L	M	M	M	L
CO5	M	S	L	M	S	L	M	M	S	S

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
MR. S. SANTHOSH	MR.S.ARULMANI	

B.Sc-Electronics & Communication Syllabus LOCF-CBCS with effect from 2021-2022 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
21M4UELN07	ARTIFICIAL INTELLIGENCE	NMEC - II	IV	2	2	-	-	2

Objective	To familiarize the fundamental concepts of Artificial Intelligence and to familiarize with various AI Techniques and Expert Systems.

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of Artificial Intelligence:** Introduction to AI -The foundation of AI- Risk and Benefits of AI - Agents and Environments - Concept of rationality - Nature of Environments - Structure of Agents.	K1-K2	3
II	**Heuristic Search Technique:** Generate and Test – Hill Climbing – Best first Search – Problem Reduction – Constraint Satisfaction - Means end Analysis.	K3-K4	3
III	**Adversarial Search and Games:** Game Theory – Optimal Decisions in Games – Alpha-Beta Search – Monte-Carlo Tree Search – Stochastic Games – Partially Observable Games – Limitation of Game Search Algorithms.	K2-K3	3
IV	**Logical Agents:** Knowledge-based Agents - Propositional Logic - Propositional Theorem Proving -Effective Propositional Model Checking – Agents Based on Propositional Logic.	K2-K3	3
V	**Knowledge Representation & Automated Planning:** Ontological engineering – Categories and Objects – Events – Mental Objects and Modal Logic – Reasoning Systems for Categories – Reasoning with Default Information.	K3-K4	3

Course Outcome	CO1: Remember and Describe the basic concepts of Artificial Intelligence.	K1
	CO2: Identify the problems and problem solving techniques.	K2
	CO3: Perform the Heuristic Search techniques.	K3
	CO4: Classify the solutions Using Predicate Logic.	K4
	CO5: Illustrate the Knowledge representations in IoT	K4

Learning Resources	
Text Books	1. Stuart Russel and Peter Norvig – "Artificial Intelligence: A Modern Approach-4th Edition, Pearson Education, 2021. 2. Kevin Night,Elaine Rich, and Nair B, "Artificial Intelligence" McGraw Hill,2008
Reference Books	1. Dan W. Patterson "Introduction to AI and ES", Pearson Education, 2007 2. Patrick H. Winston"Artificial Intelligence" Third edition, Pearson Edition, 2006
Website Link	https://onlinecourses.swayam2.ac.in/cec21_cs08/preview https://www.edx.org/course/artificial-intelligence-foreveryone?index=product&queryID=a53fab2733b55e414f508dc003ddb3c7&position=6&linked_from=autocomplete

L-Lecture, T-Tutorial, P-Practical, C-Credit

Course Code	Course Title		Course Type	Sem	Hours	L	T	P	C
21M4UELN07	ARTIFICIAL INTELLIGENCE		NMEC-II	IV	2	2	-	-	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	L	L	M	M	M	M	L
CO2	M	M	L	M	M	M	S	M	S	L
CO3	M	M	L	M	M	L	M	L	L	M
CO4	M	M	L	S	M	M	L	L	M	M
CO5	M	M	L	S	M	S	S	L	M	M

Level of Correlation between CO and PO: L-LOW , M-MEDIUM, S-STRONG	
Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Brain Storming & Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Unit Test, Assignment, Internal & Semester Examinations

Designed By	Verified By	Approved By
DR. M. KUTRALEESWARAN	MR.S.ARULMANI	