



ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY
(ESTD, UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
Rajampet, Y.S.R District, A.P – 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MEETING MINUTES of BOARD OF STUDIES

ACADEMIC YEAR: 2025-2026

Date & Time: 02/05/2026 & 10:00AM

Venue: PG Block (ECE COMPUTER LAB)



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Ref.No.:/AU/SoE/ECE/BoS-03/2025-26/MoM-02

Date: 02/05/2026

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

3rd BoS Minutes of Meeting

The 3rd meeting of the Board of Studies (BoS) for the Department of Electronics and Communication Engineering was held in offline mode on 2nd May2026 in ECE Computer Lab of the PG Block at 10:00 AM, with the following members of the board present.

Members Present:

Sl.No	Name	Affiliation	Role in BoS
1.	Dr. J. Chinna Babu	Associate Professor & Head, Dept. of ECE, Annamacharya University, Rajampet Ph:886404835 Email:jchinnababu@gmail.com	Chairman
2.	Dr. CH. Nagaraju	Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9989994021 Email:chrajuait@gmail.com	Senior Faculty-Member
3.	Dr. Fahimuddin Shaik	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9505367114 Email:fahimait@gmail.com	Senior Faculty-Member
4.	Dr. C. Venkatesh	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9985032919 Email:venky.cc@gmail.com	Course Coordinator-Member
5.	Dr. Shaik Karimullah	Assistant Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:8978078010 Email:munnu483@gmail.com	Course Coordinator-Member
6.	Dr. P. Venkata Ramana	Professor & Dean Academics, Department of ECE, MBU Tirupathi. Ph:9440076777 Email:pvrmana2604@gmail.com	Subject Expert-Member
7.	Dr. N. Balaji	Professor, Department of ECE JNTUK, Kakinada. Ph:9502441555 Email:prof.balaji.ece@gmail.com	Subject Expert-Member
8.	Dr. N. Sreekanth	Professor, Dept. of ECE GPCET, Kurnool Ph:9603709796 Email:nsreeku@gmail.com	University Nominee-Member
9.	Mr. Vikas Reddy Rapuru	Director, Technotron Pvt.Ltd, Hyderabad, Telangana. Ph:9703047292 Email:vikas@technotran.in	Industry Representative-Member



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10.	Mr. Syed Javeed Basha	Design Verification Engineer, SmartSOC Pvt.Ltd., Bangalore, Karnataka Ph:8328623437 Email:syedjaveed221@gmail.com	Alumni Representative- Member
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Members of Absence: NIL

Agenda of the Meeting:

Item No	Particulars
BoS/2026/ECE/3.1	Confirmation of the Minutes of the 2 nd Board of Studies Meeting.
BoS/2026/ECE/3.2	To review and approve the course structure and syllabi for III-B.Tech. I & II Semester, under the AU-24 Regulations.
BoS/2026/ECE/3.3	To discuss and finalize the course structure for IV-B.Tech. I & II Semester, under the AU-24 Regulations.
BoS/2026/ECE/3.4	To review and address any discrepancies observed in I & II-B.Tech. course structure and syllabi, under the AU-24 Regulations.
BoS/2026/ECE/3.5	Discussion on the inclusion of courses aligned with Sustainable Development Goals (SDGs), cross-cutting issues and Indian Knowledge System (IKS) in the curriculum of the ECE department.
BoS/2026/ECE/3.6	To discuss and approve the syllabus for the Annamacharya University Research Admission Test (AURAT) - 2026 for the ECE department.
BoS/2026/ECE/3.7	To approve the list of examiners for III B.Tech. courses/subjects.
BoS/2026/ECE/3.8	Discussion on feedback received regarding the curriculum
BoS/2026/ECE/3.9	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

Welcome and Introduction

Welcome:

Dr J. Chinna Babu, Chairman, Board of Studies has extended warm welcome to all the members.

Introduction:

At the outset, Dr J. Chinna Babu, Chairman, Board of Studies, introduced all the members of the Board of Studies and thanked them for accepting the invitation to the 3rd BoS meeting. The agenda for the ECE -BoS meeting was then read and the forum was open for individual subject deliberations.



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Agenda Item No. BoS/2026/ECE/3.1.: Confirmation of the Minutes of the 2nd Board of Studies Meeting.

The chairman has presented the minutes of 2nd Board of studies meeting of the department of ECE, Annamacharya University, Rajampet held on 9th June 2025 to be ratified. After deliberations and discussions, the 2nd BoS meeting minutes were ratified.

Agenda Item No. BoS/2026/ECE/3.2.: To review and approve the course structure and syllabi for III-B.Tech. I & II Semester, under the AU-24 Regulations.

Dr. J. Chinna Babu presented the course structure and detailed syllabi for the III B.Tech. I and II semesters of the ECE department to the members. The following points were discussed:

Dr. N. Sreekanth suggested that, in the III B.Tech. I semester, the topic “Different Modes of Wave Propagation,” currently in Unit-IV of the Antenna and Wave Propagation course, be shifted to the end of Unit-III for better continuity of concepts. He also recommended that the topics on switching circuits be removed from the Pulse and Digital Circuits course in the same semester. In addition, he suggested that the topics “Expressions for Fields,” “Characteristic Equation,” “Cut-off Frequencies,” and “Filter Characteristics” be removed from the Microwave Engineering course in the II semester.

Mr. Syed Javeed Basha suggested that additional experiments, such as the design of subtractor circuits and multiplier circuits, be introduced in the VLSI Design Laboratory course in the III B.Tech. I semester. He also recommended that the topic “SPI Interfaces” be included in Unit V of the Embedded Systems course in the III B.Tech. II semester.

Mr. Vikas Reddy Rapuru suggested that experiments in the Microprocessors and Microcontrollers Laboratory (MPMC Lab) in the III B.Tech. I semester be conducted using modern platforms such as ESP32 and MSP430, along with the existing 8051-based experiments. He also recommended incorporating open-source tools such as SCILAB and Python into the DSP Laboratory, along with MATLAB, to enhance accessibility and promote practical learning. Further, he proposed that Unit-II of the Digital Signal Processing course in the III B.Tech. II semester be renamed “Discrete and Fast Fourier Transforms” instead of “Fast Fourier Transforms” for better clarity and coverage.

Resolution:

After deliberations, the members of the Board of Studies (BoS) resolved to shift the topic “*Different Modes of Wave Propagation*” from Unit-IV to the end of Unit-III in the Antenna and Wave Propagation course of the III B.Tech. I Semester to ensure better continuity of concepts.

They further approved the removal of switching circuit topics from the Pulse and Digital Circuits course and the deletion of the topics “*Expressions for Fields*,” “*Characteristic Equation*,” “*Cut-off Frequencies*,” and “*Filter Characteristics*” from the Microwave Engineering course in the III B.Tech. II Semester.



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Additionally, it was decided to strengthen laboratory and course components by introducing subtractor and multiplier circuit design experiments in the VLSI Design Laboratory, incorporating modern platforms such as ESP32 and MSP430 in the Microprocessors and Microcontrollers Laboratory, and including SCILAB and Python alongside MATLAB in the DSP Laboratory.

The BoS also approved the inclusion of “*SPI Interfaces*” in Unit V of the Embedded Systems course and the renaming of Unit-II of the Digital Signal Processing course as “*Discrete and Fast Fourier Transforms*” to enhance clarity and comprehensiveness.

Finally, the members unanimously approved the III-B.Tech. I & II Semester Course Structure and Syllabi under AU-24 Regulations for the ECE Department. The detailed syllabi are provided in Annexure-I.

Agenda Item No. BoS/2026/ECE/3.3.: To discuss and finalize the course structure for IV-B.Tech. I & II Semester, under the AU-24 Regulations.

Dr. J. Chinna Babu presented the IV B.Tech. course structure for consideration and discussion before the members of the Board of Studies (BoS) of the Department of Electronics and Communication Engineering.

Dr. N. Sreekanth suggested revising the course title to “*5G/6G Mobile Communication Technologies*” in place of “*5G Mobile Communication Networks*” under Professional Elective–V in the IV B.Tech. I Semester. Mr. Syed Javeed Basha, an alumnus working in the VLSI domain, recommended the introduction of a course titled “*Advanced VLSI Design and Verification*” under the Professional Electives to strengthen industry-relevant skills. Mr. Vikas Reddy Rapuru, Industry Representative Member, suggested including the course “*Edge AI and Intelligent Systems*” under the Professional Electives to align the curriculum with emerging technological trends.

Resolution:

After detailed deliberations, the members of the Board of Studies (BoS) resolved to revise the course title “*5G Mobile Communication Networks*” to “*5G/6G Mobile Communication Technologies*” under Professional Elective–V in the IV B.Tech. I Semester.

Further, the BoS approved the introduction of the course “*Advanced VLSI Design and Verification*” under the Professional Electives to strengthen industry-relevant skills, and the inclusion of the course “*Edge AI and Intelligent Systems*” to align the curriculum with emerging technological trends.

After incorporating all the suggested points, the members unanimously approved the IV B.Tech. I & II Semester course structure under AU-24 Regulations for the ECE Department. The approved course structure is provided in Annexure-II.



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Agenda Item No. BoS/2026/ECE/3.4.: To review and address any discrepancies observed in I & II-B.Tech. course structure and syllabi, under the AU-24 Regulations.

The Board examined the course structure and detailed syllabi of the I and II B.Tech. under the AU-24 Regulations. It was observed that the I B.Tech. curriculum is satisfactory, with no discrepancies identified in the existing course structure and syllabi.

Dr. N. Sreekanth suggested removing the *Z-Transforms* topics from Unit-V of the *Signals and Systems* course in the II B.Tech. I Semester, as these concepts pertain to discrete-time signals and are more appropriately covered in the *Digital Signal Processing* course.

Resolution:

After detailed deliberations, the members of the Board of Studies (BoS) noted that the I B.Tech. course structure and detailed syllabi under the AU-24 Regulations are satisfactory, with no discrepancies identified. Further, the BoS resolved to remove the *Z-Transforms* topics from Unit V of the *Signals and Systems* course in the II B.Tech. I Semester, as these concepts are more appropriately covered in the *Digital Signal Processing* course. The modified syllabus of the *Signals and Systems* course is provided in Annexure–III.

Agenda Item No. BoS/2026/ECE/3.5.: Discussion on the inclusion of courses aligned with Sustainable Development Goals (SDGs), cross-cutting issues and Indian Knowledge System (IKS) in the curriculum of the ECE department.

Dr. J. Chinna Babu presented the III B.Tech. courses, including I and II Semesters, with reference to their alignment with Sustainable Development Goals (SDGs), cross-cutting issues, and the Indian Knowledge System (IKS). He highlighted that the current curriculum adequately incorporates components related to environmental sustainability, ethical practices, societal needs, and traditional knowledge systems. The members reviewed the extent of coverage and integration of these aspects across various courses in the program.

Resolution:

After detailed deliberations, the members of the Board of Studies (BoS) expressed satisfaction with the existing curriculum and resolved that no modifications are required, as the current course structure sufficiently addresses SDGs, cross-cutting issues, and IKS. The list of courses aligned with these aspects is provided in Annexure–IV.

Agenda Item No. BoS/2026/ECE/3.6.: To discuss and approve the syllabus for the Annamacharya University Research Admission Test (AURAT) - 2026 for the ECE department.

Dr. J. Chinna Babu presented the proposed syllabus for the Annamacharya University Research Admission Test (AURAT) – 2026 for the ECE Department. He explained the structure of the syllabus, which includes core subjects, fundamental concepts, and emerging areas relevant to assessing research aptitude in



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Electronics and Communication Engineering. The members reviewed the syllabus in detail and discussed its adequacy in evaluating candidates' technical knowledge and research potential.

Resolution:

After detailed deliberations, the members of the Board of Studies (BoS) approved the syllabus for the Annamacharya University Research Admission Test (AURAT) – 2026 for the ECE Department. The approved syllabus is provided in Annexure–V.

Agenda Item No. BoS/2026/ECE/3.7.: To approve the list of examiners for III B.Tech. courses/subjects.

The Chairman presented the proposed panel of examiners for the III B.Tech. ECE courses for the current academic year. The Board reviewed the qualifications and institutional affiliations of the proposed examiners and found the panel to be appropriate and in accordance with university norms.

Resolution:

After deliberations, the members of the Board of Studies (BoS) approved the proposed panel of examiners for the III B.Tech. ECE courses. The finalized list of examiners is provided in Annexure–VI.

Agenda Item No. BoS/2026/ECE/3.8.: Discussion on feedback received regarding the curriculum.

The members discussed the feedback received from stakeholders, including the Feedback Committee, Programme Assessment Committee (PAC), and Department Advisory Board (DAB), regarding the curriculum. The suggestions mainly focused on improving practical exposure through more laboratory sessions and hands-on learning, encouraging student development through sports and activities, conducting workshops on emerging technologies such as Artificial Intelligence, strengthening Campus Recruitment Training (CRT) in core areas, and increasing interaction with industry through workshops, internships, and guest lectures.

The Board also discussed the need for improving infrastructure, including the addition of a new computer laboratory, and the inclusion of the *Computer Networks* course in the curriculum. All suggestions were reviewed carefully for improving the quality of the academic program.

Resolution:

After detailed deliberations, the members of the Board of Studies (BoS) approved the suggestions received from stakeholders. It was decided to improve practical exposure by increasing laboratory sessions and hands-on experiments, promote student development through sports and related activities, and conduct workshops on emerging technologies such as Artificial Intelligence.

It was also decided to strengthen Campus Recruitment Training (CRT) in core subjects, organize more workshops, internships, and guest lectures with industry experts, provide an additional computer laboratory, and include the *Computer Networks* course in the curriculum. The detailed feedback and corresponding resolutions are provided in Annexure–VII.



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Agenda Item No. BoS/2026/ECE/3.9.: Any other item with the permission of the Chair.

Dr. J. Chinna Babu, Chairman of the Board of Studies (BoS), proposed the Vote of Thanks. He expressed his sincere appreciation to all the members for their valuable time, insightful suggestions, and active involvement in the discussions. He emphasized that the collective inputs and recommendations would contribute significantly to strengthening the curriculum and maintaining its relevance to current academic and industry requirements.

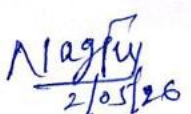
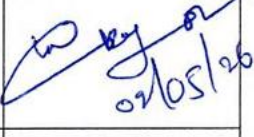
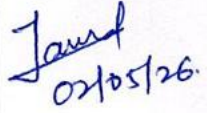


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Attendance sheet:

BoS Members:

Sl.No	Name	Affiliation	Role in BoS	Signature with Date
1.	Dr. J. Chinna Babu	Associate Professor & Head, Dept. of ECE, Annamacharya University, Rajampet Ph:886404835 Email:jchinnababu@gmail.com	Chairman	
2.	Dr. CH. Nagaraju	Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9989994021 Email:chrajuaits@gmail.com	Senior Faculty-Member	
3.	Dr. Fahimuddin Shaik	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9505367114 Email:fahimait@gmail.com	Senior Faculty-Member	
4.	Dr. C. Venkatesh	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9985032919 Email:venky.cc@gmail.com	Course Coordinator-Member	
5.	Dr. Shaik Karimullah	Assistant Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:8978078010 Email:munnu483@gmail.com	Course Coordinator-Member	
6.	Dr. P. Venkata Ramana	Professor, Department of ECE, MBU Tirupathi. Ph:9440076777 Email:pvrmana2604@gmail.com	Subject Expert-Member	ABSENT
7.	Dr. N. Balaji	Professor, Department of ECE JNTUK, Kakinada. Ph:9502441555 Email:prof.balaji.ece@gmail.com	Subject Expert-Member	ABSENT
8.	Dr. N. Sreekanth	Professor, Dept. of ECE GPCET, Kurnool Ph:9603709796 Email:nsreeku@gmail.com	University Nominee-Member	
9.	Mr. Vikas Reddy Rapuru	Director, Technotron Pvt.Ltd, Hyderabad, Telangana. Ph:9703047292 Email:vikas@technotran.in	Industry Representative-Member	
10.	Mr. Syed Javeed Basha	Design Verification Engineer, SmartSOC Pvt.Ltd., Bangalore, Karnataka Ph:8328623437 Email:syedjaveed221@gmail.com	Alumni Representative-Member	



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ANNEXURE -1



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (R24 regulations)

B.Tech. I Semester (I Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	BS	24AEEE11T	Basic Electrical and Electronics Engineering	3	0	0	3
2	BS	24ACHE11T	Chemistry	3	0	0	3
3	BS	24AMAT11T	Matrix Theory and Calculus	3	0	0	3
4	ESC	24ACSE11T	Computational Problem Solving	3	0	0	3
5	ESC	24AMEC11T	Engineering Drawing	1	0	4	3
6	BS	24AEEE11L	Basic Electrical and Electronics Engineering Lab	0	0	2	1
7	BS	24ACHE11L	Chemistry Lab	0	0	2	1
8	ESC	24ACSE11L	Computational Problem-Solving Lab	0	0	2	1
9	HSM	24ALAN11T	Language Elective	1	0	0	1
Total credits							19

Category	Credits
Basic Science Course	11
Humanities and Social Sciences and management course	01
Engineering Science Course	07
Total Credits	19

B.Tech. II Semester (I Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	BS	24APHY21T	Applied Physics	3	0	0	3
2	BS	24AMAT21T	Differential Equations and Transform Techniques	3	0	0	3
3	HSM	24AENG21T	English for Engineers	3	0	0	3
4	ESC	24AECE22T	Electronics Devices & Circuits	3	0	3	3
5	ESC	24AEEE23T	Network Analysis	3	0	0	3
6	ESC	24AMEC22L	Engineering & IT Workshop	1	0	4	3
7	BS	24APHY21L	Applied Physics Lab	0	0	2	1
8	HSM	24AENG21L	English Language Communication Skills Lab	0	0	2	1
9	ESC	24AECE22L	Electronics Devices & Circuits Lab	0	0	2	1
Total credits							21

Category	Credits
Engineering Science Course	10
Basic Science Course	07
Humanities and Social Sciences and management course	04
Total Credits	21

(Dr. N. Sreekanth)

(Mr. Vikas Reddy Rapuru)

(Mr. Syed Javeed Basha)

(Dr. J. Chinna Babu)

(Dr. CH. Nagaraju)

(Dr. S. Fahimuddin)

(Dr. C. Venkatesh)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (R24 regulations)

B.Tech. III Semester (II Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	BS	24AMAT32T	Probability and Random Process	3	0	0	3
2	HSM	24AUHV31T	Universal Human Values-II	3	0	0	3
3	PC	24AECE31T	Signals and Systems	3	0	0	3
4	PC	24AECE32T	Switching Theory & Logic Design	3	0	0	3
5	PC	24AECE33T	Analog Circuits	3	0	0	3
6	PC	24AECE31L	Signals and Systems lab	0	0	3	1.5
7	PC	24AECE32L	Switching Theory & Logic Design Lab	0	0	3	1.5
8	PC	24AECE33L	Analog Circuits lab	0	0	3	1.5
9	SEC	24AECE34L	HDL Programming (Verilog)	1	0	2	2
Total credits							21.5

Category	Credits
Basic Science Course	03
Humanities and Social Sciences and management course	03
Program Core Course	13.5
Skill oriented course	02
Total Credits	21.5

B.Tech. IV Semester (II Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	ESC	24AECE41T	Linear IC applications	3	0	0	3
2	HSM	24AMBA41T	Managerial Economics & Financial Analysis	3	0	0	3
3	PC	24AECE42T	Analog and Digital Communications	3	0	0	3
4	PC	24AECE43T	Electromagnetic waves and transmission lines	3	0	0	3
5	PC	24AECE44T	Digital System Design Using VHDL	3	0	0	3
6	MC	24AENS41T	Environmental Science	2	0	0	0
7	ESC	24AECE41L	Linear IC applications lab	0	0	3	1.5
8	PC	24AECE42L	Analog and Digital Communications lab	0	0	3	1.5
9	PC	24AECE43L	Digital System Design Using VHDL	0	0	3	1.5
10	SEC	24ACSE46L	Python Programming	1	0	2	2
Total credits							21.5
Internship 2 Months (Mandatory) during summer vacation							

Category	Credits
Engineering Science Course	4.5
Program Core Course	12
Skill oriented course	02
Humanities and Social Sciences and management course	03
Total Credits	21.5

(Dr. N. Sreekanth) (Mr. Vikas Reddy Rapuru) (Mr. Syed Javeed Basha)
 (Dr. J. Chinnababu) (Dr. CH. Nagaraju) (Dr. S. Fahimuddin) (Dr. C. Venkatesh) (Dr. S. Karimullah)



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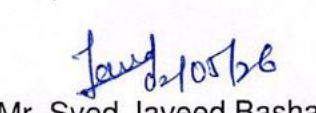
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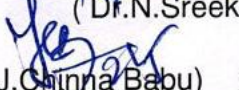
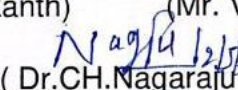
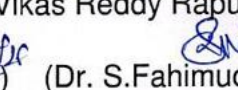
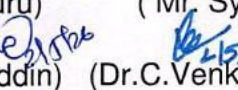
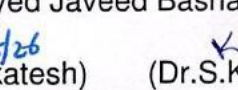
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B.Tech. V Semester (III Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	24AECE51T	VLSI Design	3	0	0	3
2	PC	24AECE52T	Microprocessors and Micro controllers	3	0	0	3
3	PC	24AECE53T	Antenna & Wave Propagation	3	0	0	3
4	PE-I	24AECE5AT	Pulse and Digital Circuits	3	0	0	3
5		24AECE5BT	AI and Machine learning for ICs				
6		24AECE5CT	Control systems				
7		24AECE5DT	Internet of Things				
8		24AECE5ET	Quantum Technology for Electronics Engineers				
9	OE-I	24AECE5FT	MOOCS	3	0	0	3
10	MC	24AMBA51T	Technical Paper Writing & IPR	2	0	0	0
11	PC	24AECE51L	VLSI Design Lab	0	0	3	1.5
12	PC	24AECE52L	Microprocessors and Microcontrollers Lab	0	0	3	1.5
13	HSM	24AENG51S	Soft Skills	1	0	2	2
14	INTERN	24AECE5FI	Summer Internship 2 Months	0	0	0	2
Total credits							22

Category	Credits
Program Core Course	12
Program Elective Course	03
Open Elective Course	03
Humanities and Social Sciences and Management course	02
Internship	02
Total Credits	22

 (Dr. N. Sreekanth)
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RAJAMPET, Y.S.R District, AP – 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (R24 regulations)

B.Tech. VI Semester (III Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	24AECE61T	Embedded Systems	3	0	0	3
2	PC	24AECE62T	Microwave Engineering	3	0	0	3
3	PC	24AECE63T	Digital Signal Processing	3	0	0	3
4	PE-II	24AECE6AT	Electronic Measurements & Instrumentation	3	0	0	3
5		24AECE6BT	Digital System Design				
6		24AECE6CT	Radar Engineering				
7		24AECE6DT	Introduction to Deep learning				
8		24AECE6ET	Biomedical Signal Processing				
9	OE-II	24AECE6FT	MOOCS	3	0	0	3
10	AC	24AAUD51T	Gender Sensitization	2	0	0	0
10	PC	24AECE61L	Embedded Systems Lab	0	0	3	1.5
11	PC	24AECE62L	Microwave Engineering Lab	0	0	3	1.5
12	PC	24AECE63L	Digital signal Processing Lab	0	0	2	1
13	SEC	24ACSE65S	JAVA Programming	1	0	2	2
Total credits							21
Industrial/Research Internship (Mandatory) 2 Months during summer vacation							

Category	Credits
Program Core Course	13
Program Elective Course	03
Open Elective Course	03
Skill oriented course	02
Total Credits	21

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : VLSI Design
Category : PC
Year : III
Semester : I
Course Code : 24AECE51T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Comprehend the steps involved in fabrication of ICs using MOS transistor technology.
2. To learn about the VLSI design processes, Stick diagrams and Layouts.
3. To gain knowledge on the Gate Level Design concepts.
4. To learn the design of various subsystems with different VLSI Design styles.
5. To get familiar with CMOS testing techniques.

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the steps involved in fabrication of ICs using MOS transistor technology.
2. Learn about the VLSI design processes, Stick diagrams and Layouts.
3. Gain knowledge on the Gate Level Design concepts.
4. Learn the design of various subsystems with different VLSI Design styles.
5. Familiar with CMOS testing techniques.

Unit 1 Introduction

10

Brief Introduction to IC technology MOS, PMOS, NMOS, CMOS & BiCMOS Technologies. Basic Electrical Properties of MOS and Bi CMOS Circuits: $I_{DS} - V_{DS}$ relationships, MOS transistor Threshold Voltage, figure of merit, Transconductance, Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

Unit 2 VLSI Circuit Design Processes

13

VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, Lambda(λ)-based design rules for wires, contacts and Transistors, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

Unit 3 Gate level Design

14

Switch logic, Alternate gate circuits. Basic Circuit Concepts: Sheet Resistance R_s and its concepts to MOS, Area Capacitances calculations, Inverter Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out

Unit 4 Subsystem Design

10

Barrel Shifters, High speed Adders ALUs, Multipliers-Tree based, Booth encoding and Dadda. Synchronous Counters, High density memory element Standard Cells, FPGAs, CPLDs.

Unit 5 CMOS Testing

12

Design methods, Design capture tools, Design verification tools, Need for testing, Design for testability - built in self-test (BIST)- scan design techniques.

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Prescribed Textbooks:

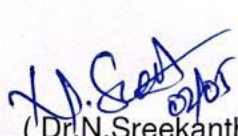
1. Essentials of VLSI Circuits and Systems, Kamran Eshraghian, EshraghianDouglas, A. Pucknell, 2005, PHI
2. Modern VLSI Design – Wayne Wolf, 3 Ed., 1997, Pearson Education.

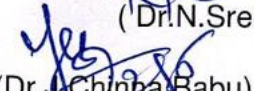
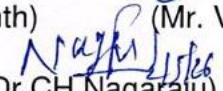
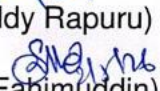
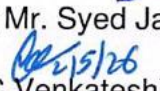
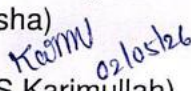
Reference Books:

1. CMOS VLSI Design-A Circuits and Systems Perspective, Neil H.E Weste, David Harris, Ayan Banerjee, 3rd Ed, Pearson,2009.
2. BehzadRazavi, —Design of Analog CMOS Integrated Circuits, McGraw Hill, 2003.
3. M. Rabaey, —Digital Integrated Circuits||, AnanthaChandrakasan and Borivoje Nikolic, Prentice-Hall of India Pvt.Ltd, 2nd edition, 2009

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE51T.1	3	3	2	1	-	2	-	-	-	-	1	2	1
24AECE51T.2	3	2	1	1	-	2	-	1	-	-	-	2	-
24AECE51T.3	3	3	3	2	-	-	-	1	-	-	-	3	-
24AECE51T.4	3	3	3	2	-	-	-	1	-	-	-	3	-
24AECE51T.5	3	1	1	1	1	1	2	-	-	-	1	2	2

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Microprocessors and Microcontrollers
Category : PC
Year : III
Semester : I
Course Code : 24AECE52T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To learn the fundamental architectural concepts of 8086 Microprocessor.
2. To get familiar with Assembly Language Program concepts .
3. To learn about Interfacing of I/O devices with 8086.
4. To Comprehend fundamentals of the 8051 Microcontroller
5. To learn interfacing with the 8051 Microcontroller.

Course Outcomes:

At the end of the course, the student will be able to:

1. Comprehend the Architectural features of 8086.
2. Analyze programming concepts of 8086.
3. Interface I/O devices with 8086.
4. Comprehend the overview of basic microcontroller.
5. Learn the interfacing methods for 8051 microcontroller for various applications

Unit 1 Introduction to 8086 Microprocessor

12

Architecture of 8086, Register organization, Memory organization, Pin diagram of 8086 - Minimum mode and maximum mode of operation, Timing diagrams. I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O. Basic structure of SRAM and DRAM cell, Need For DMA.

Unit 2 8086 Programming.

14

Addressing modes of 8086, Instruction set of 8086, Assembler directives, Assembly language programs involving arithmetic, logical, branch and call instructions, sorting, string manipulation.

Unit 3 Interfacing with 8086

12

Interfacing I/O ports – latches and buffers. 8255 PPI - Architecture, various modes of operation and interfacing to 8086. Seven segment Displays, Stepper motor, D/A, A/D converter interfacing. 8251 USART architecture.

Unit 4 Overview of 8051 Microcontroller

12

roduction, Architecture, Memory Organization, Pin diagram, I/O ports. Addressing modes, Instruction Set, simple programs. On-Chip Peripherals - 8051 Interrupt Structure, Timer/Counter features, Serial Communication.

Unit 5 Interfacing of 8051 microcontroller and its applications.

10

Interfacing of Push button switches, LEDs, Seven segment displays, LCD, Keypad, D/A and A/D and Stepper motor.

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02/15/20 02/10/20 02/10/20

Prescribed Textbook:

1. Microprocessors and Interfacing – N.Senthil Kumar, M.Saravanan, S.Jeevananthan & S.K.Singh .Oxford University Press,2012.

Reference Books:

1. Advanced microprocessor and peripherals- A.K. Ray and K.M.Bhurchandi, 2nd edition, TMH,2000.
2. Microprocessors and Interfacing- Douglas V. Hall, 2nd edition,2007.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE52T.1	3	2	1	2	2	-	-	-	-	-	-	1	3
24AECE52T.2	3	2	2	1	2	-	-	-	-	2	-	1	3
24AECE52T.3	3	2	2	2	2	-	-	-	-	2	-	1	3
24AECE52T.4	3	2	2	2	2	-	-	-	-	2	-	1	3
24AECE52T.5	3	2	3	2	2	-	-	-	-	3	-	2	3

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Antennas and Wave Propagation
Category : PC
Year : III
Semester : I
Course Code : 24AECE53T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To understand the concepts of antennas and their family.
2. To analyze and design different antennas for various applications.
3. To understand concepts of various wave propagation methods.

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend and analyze fundamental antenna parameters, radiation mechanisms, antenna field regions, and radiation characteristics of basic antennas such as small dipole, monopole, and half-wave dipole.
2. Design BSA, EFA etc., Antenna arrays. Parasitic arrays and Yagi- Uda antenna.
3. Analyze the construction, radiation characteristics, design considerations, and applications of helical, horn, and reflector antennas.
4. Analyze the propagation of wave and different parameters and Knowledge on all the layers of atmosphere and the nature of different Propagation mechanisms.
5. Explain and analyze space wave and sky wave propagation phenomena including ionospheric layers, critical frequency, MUF, skip distance, and tropospheric effects.

Unit 1 Introduction

14

Introduction, Basic Antenna Parameters, Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity and Gain, Directivity and Resolution, Antenna Apertures, Effective Height, Fields from Oscillating dipole, Antenna Field Zones. Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Evaluation of Field Components, Antenna Theorems – Reciprocity Theorem.

Unit 2 Antenna Arrays

14

Point Source, Arrays of two isotropic point sources-Different cases, non-isotropic point Sources, Principle of Pattern Multiplication, N element Uniform Linear, Arrays Broadside, End fire Arrays, EFA with Increased Directivity, Arrays with Parasitic Elements, Folded Dipoles & their characteristics, Yagi - Uda Arrays.

Unit 3 Antennas and their Characteristics

10

Helical Antennas: Helical Geometry, Helix modes, Horn Antennas – Introduction, Optimum Horns, Rectangular Horn antenna, Reflector Antennas: Flat Sheet and Corner Reflectors. Paraboloidal Reflectors – Geometry, characteristics, Spill Over, Back Lobes, Aperture Blocking, Different modes of Wave Propagation.

Unit 4 Ground Wave Propagation

9

Ground Wave Propagation– Introduction, Plane earth reflection, Space wave and surface wave, Transition between surface and space wave, Reduction factor, numerical Distance, Earth's Behavior at different frequencies, Electrical Properties of earth, curved earth reflection.

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Unit 5 Space Wave Propagation and Sky Wave Propagation**12**

Space Wave Propagation- Introduction, Effect of imperfection of Earth, Effects due to - curvature of earth, Shadowing of hills and buildings, Electronics and Communication Engineering 166 Variation of field strength with Height, Super refraction, Scattering Phenomena, Tropospheric propagation.

Sky Wave Propagation- Structural details of Ionosphere, Wave propagation mechanism, Refraction and reflection of Sky waves by Ionosphere, Ray path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and Skip distance, Multi hop propagation, Take-off angle.

Prescribed Textbooks:

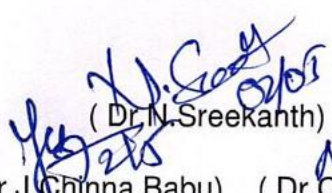
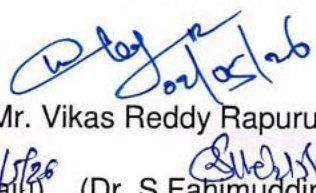
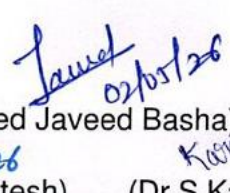
1. John D. Kraus, Ronald J. Marhefka and Ahmad S Khan – Antennas and Wave Propagation, TMH, 4e, Special Indian Edition 2010.

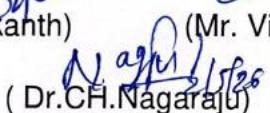
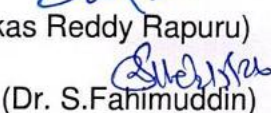
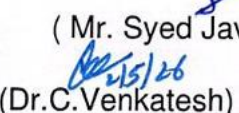
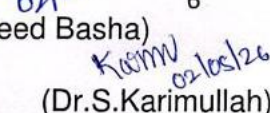
Reference Books:

1. K.D. Prasad - Antenna and wave propagation, Khanna Publications.
2. Antenna Theory. - Balanis.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE53T.1	3	3	3	2	-	-	-	-	2	-	-	3	2
24AECE53T.2	2	2	3	2	-	-	-	-	2	-	2	3	2
24AECE53T.3	1	1	3	3	-	1	-	-	-	-	1	3	2
24AECE53T.4	2	2	2	2	-	2	-	-	2	-	2	3	2
24AECE53T.5	2	2	2	2	-	2	-	-	2	-	2	3	2

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Pulse and Digital Circuits
Category : PE
Year : III
Semester : I
Course Code : 24AECE5AT
Branches : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To study various wave shaping circuits and their applications
2. To study and acquire knowledge on different circuits that produce non- sinusoidal waveforms.
3. To study various voltage time base generators, Logic gates etc.

Course Outcomes:

At the end of the course, the student will be able to

1. Design and analyze linear and non-linear wave shaping circuits
2. Design and analyze different multivibrator circuits.
3. Identify and differentiate various time base generators.
4. Understand the operation and realization of different sampling gates and logic families.
5. Understand the concepts sampling gates and logic families, Design logic gates using different logic families.

Unit 1 Linear Wave Shaping

12

High pass & low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and Exponential Inputs. High pass RC network as differentiator, Low pass RC network as integrator, attenuators, ringing circuit.

Unit 2 Non-Linear Wave Shaping

12

Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, clamping operation, clamping circuit taking source and diode resistance into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage

Unit 3 Multivibrators

15

Design and analysis of Bi-stable, Monostable & Astable Multivibrator with BJT. Schmitt trigger circuit, Symmetrical & Un Symmetrical Triggering of Bi-stable Multivibrator, Monostable Multivibrator.

Unit 4 Time Base Generators

11

Voltage time base generators: General features of a time base signal, methods of generating time base waveform, Principle and working of Miller and Bootstrap time base generators. Current time base generators: Simple current sweep circuit, linearity correction through driving waveform.

Unit 5 Sampling Gates, Logic Gates and Logic Families

10

Sampling Gates: Basic operation and principle of Sampling gates, uni-directional diode sampling gate, Bi-Directional diode & Transistor sampling gates. Realization of AND, OR, NOT gates using diodes and transistors, Inhibit operation, classification of logic families, DTL, RTL, DCTL, TTL.

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Prescribed Textbooks:

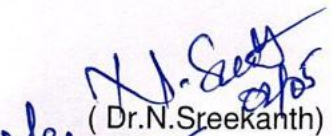
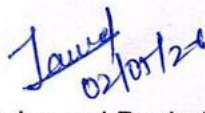
1. J. Millman and H. Taub, Pulse, Digital and Switching Waveforms, McGraw-Hill, second edition, 2007.

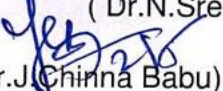
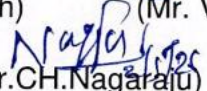
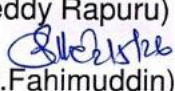
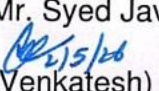
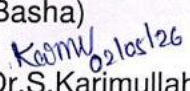
Reference Books:

1. Fundamentals of pulse and digital circuits-Ronald j. Tocci, third edition, 2008.
2. Solid state pulse circuits-David A. Bell, 4th Edition, 2002PHI.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE5AT.1	3	3	2	3	3	1	-	1	-	-	3	3	2
24AECE5AT.2	3	3	3	3	3	-	-	-	-	-	3	3	2
24AECE5AT.3	3	2	2	2	-	-	-	-	-	-	3	2	2
24AECE5AT.4	3	3	3	3	3	-	-	-	-	-	3	3	1
24AECE5AT.5	3	3	2	3	3	-	-	-	-	-	3	2	3

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : AI and Machine Learning for ICs
Category : PE
Year : III
Semester : I
Course Code : 24AECE5BT
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. Understand fundamentals of Artificial Intelligence and Machine Learning in the context of VLSI and IC design.
2. Apply ML techniques to IC design automation, optimization, and verification.
3. Analyze data-driven approaches for performance, power, and reliability improvement in ICs.
4. Design AI-assisted solutions for modern semiconductor challenges.
5. Explore emerging trends such as ML-driven EDA and AI accelerators.

Course Outcomes:

At the end of the course, the student will be able to

1. Understand fundamentals of Artificial Intelligence and Machine Learning in the context of VLSI and IC design.
2. Apply ML techniques to IC design automation, optimization, and verification.
3. Analyze data-driven approaches for performance, power, and reliability improvement in ICs.
4. Design AI-assisted solutions for modern semiconductor challenges
5. Explore emerging trends such as ML-driven EDA and AI accelerators.

Unit 1 Introduction to AI & ML for IC Design

12

Artificial Intelligence: definition, scope, and evolution. Fundamentals of Machine Learning. Types of learning: supervised, unsupervised, and reinforcement learning. Role of AI/ML in the semiconductor industry. Overview of IC design flow. Challenges in modern IC design such as scaling, power, and variability. Limitations of conventional IC design methods. Motivation for AI/ML-based IC design automation. Case studies highlighting AI adoption in IC design.

Unit 2 Data Modeling and Feature Engineering for ICs

12

Data sources in IC design including simulation, layout, and process data. Characteristics of IC datasets. Data preprocessing techniques: normalization, noise removal, handling missing values. Feature extraction from circuit parameters and physical design data. Feature scaling techniques. Dimensionality reduction using Principal Component Analysis. Dataset preparation, training-testing split, and validation strategies. Practical considerations in IC data modeling.

Unit 3 Machine Learning Algorithms for IC Applications

12

Regression techniques for IC parameter prediction. Linear and logistic regression for delay, power, and fault analysis. k-Nearest Neighbors and decision tree algorithms. Support Vector Machines for IC classification tasks. Clustering techniques for yield and fault analysis. Model training, validation, and testing. Performance evaluation metrics for IC-related ML problems. Case studies on ML-based yield and performance prediction.

Unit 4 Deep Learning for IC Design and Verification

12

Introduction to neural networks. Artificial neuron model and learning process. Multilayer perceptron and backpropagation algorithm. Deep learning architectures. Convolutional Neural Networks and their applications in IC layout analysis. Deep learning for defect detection and verification. ML-assisted timing, power, and area optimization. Overview of deep learning-enabled EDA tools and workflows.

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Unit 5 Advanced Topics and Case Studies**12**

Reinforcement learning fundamentals and applications. Reinforcement learning for IC floor-planning and placement. AI accelerators and machine learning hardware architectures. ML techniques for yield prediction and reliability analysis. Process variation modeling using ML. Emerging trends in AI-driven IC design. Industrial case studies and future scope of autonomous IC design.

Prescribed Textbooks:

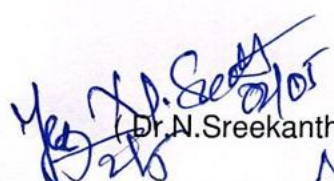
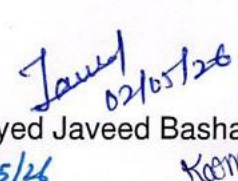
1. Tom M. Mitchell, Machine Learning, McGraw-Hill Education, 1st Edition.
2. Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, MIT Press, 2016.

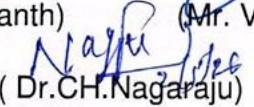
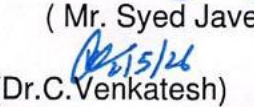
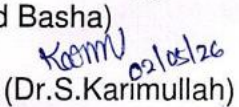
Reference Books:

1. Chris Bishop, Pattern Recognition and Machine Learning, Springer, 1st Edition.
2. Mohammed S. Abdelfattah, Deshanand Singh, Machine Learning for VLSI Design and EDA, Morgan & Claypool Publishers.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE5BT.1	3	2	1	1	1	-	-	-	-	-	1	2	1
24AECE5BT.2	3	3	2	1	3	-	-	-	-	-	2	3	2
24AECE5BT.3	2	3	2	2	3	-	-	-	-	-	2	3	2
24AECE5BT.4	2	2	3	2	3	-	-	-	-	-	2	3	3
24AECE5BT.5	2	2	2	2	3	-	-	-	-	-	3	2	3

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ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Control Systems
Category : PE
Year : III
Semester : I
Course Code : 24AECE5CT
Branch/es : ECE

Lecture Hours

3

Tutorial Hours

0

Practice Hours

0

Credits

3

Course Objectives:

1. Describe the basic principles and applications of control systems.
2. Explain and analyze the time response and steady-state response of control systems
3. Apply time-domain analysis techniques to obtain solutions for linear time-invariant systems.
4. Analyze and evaluate system stability using frequency-domain methods
5. Explain the concepts of state-space representation, controllability, and observability, and analyze their significance in system design

Course Outcomes:

At the end of the course, the student will be able to

1. Apply fundamental principles of control systems to model systems using appropriate mathematical representations
2. Analyze the time-response characteristics of control systems to evaluate transient and steady-state behavior.
3. Analyze system stability using standard stability analysis techniques
4. Construct and analyze frequency-domain plots such as Bode plots, Polar plots, and Nyquist plots for control system analysis
5. Evaluate control systems using state-space methods with respect to stability, controllability, and observability.

Unit 1 Basic Concepts of Control Systems and Transfer Function Modeling

12

Basic control system components, Classification- Open Loop and closed loop control systems and their differences, Feedback principle, Effect of feedback, Mathematical models. Transfer function-Block Diagram representation, Signal Flow graph and Mason's gain formula

Unit 2 Transient and steady-state analysis of LTI systems

12

Types of test signals, Type and Order of system, Time Response of first order system and second order system, Time domain specifications, Static error constants. Steady state error, Basics of P, PI, PD and PID controllers

Unit 3 Stability analysis in Time domain

12

Routh-Hurwitz stability criterion, Root locus concept and Construction of root loci, Effects of adding poles and zeros to $G(s)$ $H(s)$ on the root loci.

Unit 4 Stability analysis in Frequency domain

12

Frequency domain specifications, Stability Analysis from Bode Plots. Polar Plots, Nyquist stability criterion-simple problems, Introduction to compensators- Lag, Lead and Lag-Lead.

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Unit 5 State Space Analysis**12**

Concepts of state, state variables and state Space Model, Solution of state equations of LTI systems
State transition Matrix and its properties ,Concepts of controllability and observability

Prescribed Textbooks:

1. J. Nagrath and M. Gopal, *Control Systems Engineering*, 8th edition, New Age International (P) Limited, Publishers

Reference Books:

1. A. Nagoor Kani, *Control Systems*, 3rd Edition, RBA Publications
2. Katsuhiko Ogata, *Modern Control Engineering*, 3rd edition, Prentice Hall of India Pvt. Ltd., 1998.
3. A. Anand Kumar, *control systems*, Eastern Economy edition, PHI learning private Ltd, 2011.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE5CT.1	3	3	2	1	2	-	-	-	-	-	-	2	2
24AECE5CT.2	3	3	2	2	2	-	-	-	-	-	-	2	2
24AECE5CT.3	3	3	3	2	2	-	-	-	-	-	-	2	2
24AECE5CT.4	3	3	3	2	3	-	-	-	-	-	-	2	2
24AECE5CT.5	3	3	3	2	3	-	-	-	-	-	-	2	2

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Internet of Things
Category : PE
Year : III
Semester : I
Course Code : 24AECE5DT
Branch/es : ECE

Lecture Hours

3

Tutorial Hours

0

Practice Hours

0

Credits

3

Course Objectives:

1. To introduce the fundamentals, evolution, architecture, and enabling technologies of the Internet of Things (IoT).
2. To explain various IoT application domains and real-world case studies including smart homes, smart cities, environment, energy, agriculture, industry, and healthcare.
3. To describe the concepts of IoT and Machine-to-Machine (M2M) communication, highlighting their differences and the role of SDN and NFV in IoT systems.
4. To develop logical IoT system designs using Python programming, covering data structures, control flow, modular programming, and file handling.
5. To provide hands-on knowledge of IoT physical devices and endpoints, with emphasis on Raspberry Pi architecture, interfaces, and Python-based programming.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain the vision of the Internet of Things (IoT) from a global perspective.
2. Evaluate IoT applications in healthcare, health monitoring, and lifestyle enhancement systems.
3. Identify the differences between IoT and M2M (Machine-to-Machine) communication
4. Create IoT-based experiments with the help of Python programming.
5. Design and develop IoT applications using a Raspberry Pi kit.

Unit 1 Introduction to Internet of Things

10

Introduction to Internet of Things, History of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment Templates, Applications of IoT.

Unit 2 IoT Applications and Case Studies

10

Introduction, Home Automation, Cities, Environment, Energy, Retail, Agriculture, Industry, Health & Lifestyle

Unit 3 IoT and M2M & IoT Platforms Design Methodology

10

IoT and M2M: Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT. IoT Platforms Design Methodology: Introduction, IoT Design Methodology.

Unit 4 IoT Systems-Logical Design Using Python

10

Introduction, Installing Python, Python Data Types and Data Structures, Control Flow, Functions, Modules, Packages and File Handling.

Unit 5 IoT Physical Devices and Endpoints

11

What is an IoT Device, Exemplary Device: Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python, Other IoT Devices.

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(Dr. S. Karimullah)

Prescribed Textbooks:

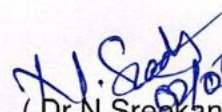
1. Internet of Things, A Hands-On Approach, Arshdeep Bahga, Vijay Madiseti, University Press, 2014

Reference Books:

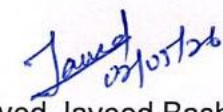
1. The Internet of Things Connecting Objects to the Web, Hakima Chaouchi, Wiley publications, 2010
2. Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Wiley 2014.
3. Enterprise IoT, A Definitive Handbook by Naveen Balani.

CO-PO Mapping:

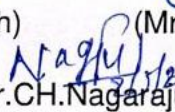
Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE5DT.1	2	1	1	2	1	-	-	-	-	-	1	1	-
24AECE5DT.2	2	2	1	2	2	-	-	-	-	-	1	2	1
24AECE5DT.3	2	2	1	2	1	-	-	-	-	-	1	1	-
24AECE5DT.4	1	2	3	2	3	-	-	-	-	-	2	3	2
24AECE5DT.5	1	2	3	2	3	-	-	-	-	-	2	3	3

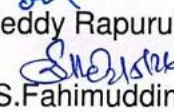

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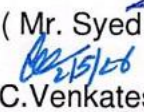

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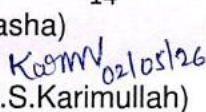

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Quantum Technology for Electronics Engineers
Category : PE
Year : III
Semester : I
Course Code : 24AECE5ET
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. Introduce the fundamental principles of quantum mechanics and quantum technology.
2. Provide knowledge of quantum bits, quantum gates, and quantum circuits for processing.
3. Familiarize students with important quantum algorithms and highlight their computational advantages over classical algorithms.
4. Explain various physical realizations and implementation requirements of quantum computers.
5. Expose students to applications of quantum computing in communication, information processing, and emerging technologies.

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the fundamental concepts of quantum technology.
2. Analyze basic quantum gates and quantum circuits using single and multiple qubits.
3. Interpret standard quantum algorithms and evaluate their advantages over classical approaches.
4. Describe physical realizations and implementation requirements of quantum computers.
5. Comprehend various applications of quantum computing.

Unit 1 Introduction to Quantum Technology

09

Introduction to Quantum Technology, Bits to Qubits, Power of Quantum Computing, How Quantum Physics Differs from Classical Physics, Concepts of Quantum Mechanics, Quantum Bits and Multiple Qubits.

Unit 2 Quantum Gates and Circuits

12

Basic ideas of Single Qubit Gates: Quantum NOT Gate, Z Gate, Hadamard Gate, Phase gate, Multiple Qubit Gates : Controlled NOT Gate, Swap gate, Controlled Z Gate, Toffoli Gate, Qubit coping circuit, Quantum Half-Adder and Subtractor.

Unit 3 Quantum Computing Algorithms

12

Shor's Algorithm, Quantum Fourier Transform and implementation using quantum gates(overview), Phase estimation, Steps in Grover's search Algorithm, Utility of the Quantum Search algorithm over classical Databases.

Unit 4 Physical realization of Quantum computers

10

Basic requirement for quantum computation, Harmonic Oscillator Quantum computer, Optical photon Quantum computer, Ion Traps, Nuclear Magnetic Resonance, Silicon quantum computer

Unit 5 Applications of Quantum Computing

09

Quantum Teleportation, Quantum Parallelism, Superdense Coding, Quantum Communication, Advantages of quantum communication

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Prescribed Textbooks:

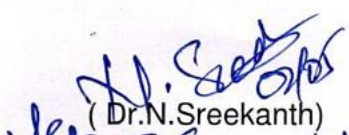
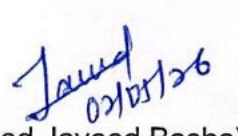
1. Vishal Sahni, Quantum Computing, Tata McGraw Hill Education Private Limited, First Edition, 2010.

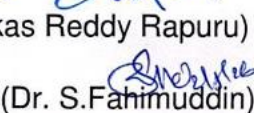
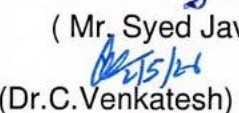
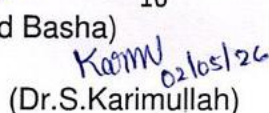
Reference Books:

1. Michael A. Nielsen, Isaac L. Chuang, *Quantum Computation and Quantum Information*, Cambridge University Press, 10th Edition, 2010
2. Eleanor Rieffel and Wolfgang Polak, *Quantum Computing A Gentle Introduction*, MIT Press, 2011
3. Chris Bernhardt, *Quantum Computing for Everyone*, MIT Press, 2019.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE5ET.1	2	2	1	1	-	2	-	-	1	-	2	2	-
24AECE5ET.2	3	3	2	2	-	3	-	-	2	-	3	3	-
24AECE5ET.3	2	2	1	1	-	2	-	-	1	-	2	2	-
24AECE5ET.4	2	2	1	1	-	2	-	-	1	-	2	2	-
24AECE5ET.5	2	2	1	1	-	2	-	-	1	-	2	2	-

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ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY
(ESTD, UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

Title of the Course:	TECHNICAL PAPER WRITING AND INTELLECTUAL PROPERTY RIGHTS	
Category:	MC	
Year	III Year	
Semester:	I Semester	
Course Code:	24AMBA51T	
Branch/es:	CE, ME	

Lecture Hours	Tutorial Hours	Practice Hours	Credits
2	0	0	0

Course Objectives:

1. To enable the students to practice the basic skills of research paper writing.
2. To make the students understand the importance of IP and to educate them on the basic concepts of Intellectual Property Rights.
3. To practice the basic skills of performing quality literature review.
4. To help them in knowing the significance of real-life practice and procedure of Patents.
5. To enable them learn the procedure of obtaining Patents, Copyrights, & Trade Marks.

Course Outcomes:

At the end of the course, the student will be able to

1. Identify key secondary literature related to their proposed technical paper writing.
2. Explain various principles and styles in technical writing.
3. Use the acquired knowledge in writing a research/technical paper.
4. Analyze rights and responsibilities of holder of Patent, Copyright, Trademark, International Trademark etc.
5. Evaluate different forms of IPR available at national & international level and search of various forms of IPR by using modern tools and techniques.

Unit 1	Principles of Technical Writing	6
Principles of Technical Writing: styles in technical writing; clarity, precision, coherence and logical sequence in writing-avoiding ambiguity- repetition, and vague language -highlighting your findings-discussing your limitations -hedging and criticizing -plagiarism and paraphrasing.		

Unit 2	Research Paper Writing	6
Technical Research Paper Writing: Abstract- Objectives-Limitations-Review of Literature- Problems and Framing Research Questions- Synopsis.		

Unit3	Process of research	6
Process of research: publication mechanism: types of journals- indexing-seminars- conferences- proof reading -plagiarism style; seminar & conference paper writing; Methodology-discussion-results- citation rules.		

Unit 4	Introduction to Intellectual property	6
Introduction, types of intellectual property, International organizations, agencies and treaties, importance of intellectual property rights Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.		

Unit 5	Fundamentals of copy right law	6
Fundamentals of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer. Patent law, intellectual property audits.		
Prescribed Textbooks:		
1. Deborah. E. Bouchoux, Intellectual Property Rights, Cengage Learning India, 2013.		

Reference Books:
1. R.Myneni, Law of Intellectual Property, 9th Ed, Asia law House, 2019.
2. Prabuddha Ganguli, Intellectual Property Rights Tata McGraw Hill, 2001.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering Tool usage	The Engineer and The World	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
24AMBA61T-1	3	2	2	2	1	2	-	-	-	1	-	2	1
24AMBA61T-2	2	3	3	2	2	1	-	-	-	-	-	2	2
24AMBA61T-3	3	2	3	2	2	1	1	-	-	-	-	1	1
24AMBA61T-4	2	3	2	2	2	1	1	-	-	-	-	1	2
24AMBA61T-5	2	2	2	1	3	1	1	-	-	1	1	1	2

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5. <i>P. R. Datta</i>	6. <i>P. R. Datta</i>	7. <i>P. R. Datta</i>	8. <i>P. R. Datta</i>
			9. <i>P. R. Datta</i>



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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : VLSI Design Lab
Category : PC
Year : III
Semester : I
Course Code : 24AECE51L
Branch/es : ECE

Lecture Hours

0

Tutorial Hours

0

Practice Hours

2

Credits

1

Course Objectives:

1. To Comprehend the programming language Constructs in Verilog.
2. To develop the verilog code for different logic Circuits
3. To analyze the functionality of logic Circuits through output waveforms generated.

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the digital circuits design using Verilog HDL.
2. Develop the Verilog code for different logic Circuits.
3. Analyze the functionality of logic Circuits through output waveforms generated.

LIST OF EXPERIMENTS: (Perform any 10 experiments)

1. Design of CMOS gates
2. Design of Adder Circuits
3. Design of subtractor Circuits
4. Design of Multiplier Circuits
5. Design of Multiplexers
6. Design of Demultiplexers
7. Design of Encoders
8. Design of Decoders
9. Design of Flip-Flops
10. Design of ALU.
11. Design of Synchronous Counters.
12. Design of 1-bit RAM Cell.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE51L.1	2	3	2	2	2	2	-	2	2	-	-	2	2
24AECE51L.2	2	3	2	2	3	-	-	2	2	-	-	2	2
24AECE51L.3	2	3	2	2	3	-	-	2	2	-	-	2	2

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course :	Microprocessors and Microcontrollers Lab
Category :	PC
Year :	III
Semester :	I
Course Code :	24AECE52L
Branch/es :	ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

Course Objectives:

1. To become skilled in 8086 Assembly Language programming.
2. To understand the detailed software and hardware structure of the microprocessor.
3. Train their practical knowledge through laboratory experiments.
4. To understand and learn 8051 Microcontroller.
5. To acquire knowledge on microprocessors and microcontrollers, interfacing various peripherals, and configuring.

Course Outcomes:

At the end of the course, the student will be able to:

1. Formulate a program and implement algorithms using Assembly language.
2. Describe an Assembly language program for the 8086 Microprocessor.
3. Develop programs for different applications in the 8086 Microprocessor
4. Interface peripheral devices with 8086.
5. Describe an Assembly language program for the 8051 Microcontroller.

LIST OF EXPERIMENTS: (Perform any 10 experiments)

8086 Microprocessor

1. Unsigned Arithmetic operations.
2. Signed Arithmetic operations.
3. ASCII – Arithmetic operations.
4. Addition of two BCD numbers (4-digit each).
5. Code conversion.
6. Identify the parity (even/Odd) of a given byte/word.
7. String Operations:
 - a. Relocate a string of N words/bytes.
 - b. Reverse String.
 - c. Length of the String.
 - d. String Insertion.
 - e. String Deletion.
 - f. Scanning a byte/ word.
8. LED/Seven Segment Display Interfacing.
9. DAC Interfacing.
10. Stepper Motor Interfacing.

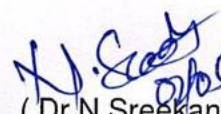
8051 Microcontroller

11. Arithmetic operations:
 - a) Addition and Subtraction.
 - b) Multiplication and Division.
12. Programs related to Register banks.
13. Reading from and Writing to a port of 8051.

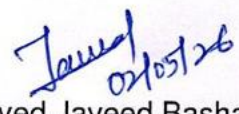
(Dr. N. Sreekanth) (Mr. Vikas Reddy Rapuru) (Mr. Syed Javeed Basha) 18
(Dr. J. Chinna Babu) (Dr. CH. Nagaraju) (Dr. S. Fahimuddin) (Dr. C. Venkatesh) (Dr. S. Karimullah)

CO-PO Mapping:

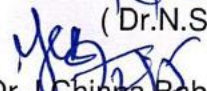
Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE52L.1	2	3	2	2	2	-	-	-	-	-	-	2	2
24AECE52L.2	2	3	2	2	3	-	-	2	-	-	-	2	1
24AECE52L.3	2	3	2	2	3	-	-	2	-	-	-	2	2
24AECE52L.4	2	3	1	2	3	-	-	-	-	-	-	2	1
24AECE52L.5	2	3	3	2	3	-	-	2	-	-	-	2	2

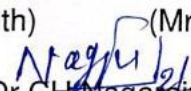

(Dr. N. Sreekanth)

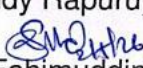

(Mr. Vikas Reddy Rapuru)

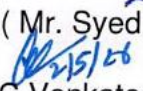

(Mr. Syed Javeed Basha)

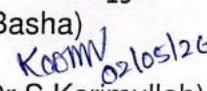
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(Dr. J. Chinna Babu)


(Dr. CH. Nagaraju)


(Dr. S. Fahimuddin)


(Dr. C. Venkatesh)


(Dr. S. Karimullah)



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(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
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RAJAMPET, YSR Kadapa District, AP – 516126, INDIA

Title of the Course	Soft Skills
Category	SEC
Course Code	24AENG51S/24AENG61S
Branch	ECE / CE, ME, CSE, AIDS, AIML, CSE(AI), CSE(DS), CSE(AIML), CSE(ICB)
Year:	III B.Tech
Semester	I/II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
1	0	2	2

Course Objectives:

1. To encourage all-round development of the students by focusing on soft skills
2. To make the students aware of critical thinking and problem-solving skills
3. To enable appropriate communication in socio-cultural and professional contexts
4. To enhance students' skills of making presentations confidently.
5. To suggest some measures to function effectively with heterogeneous teams

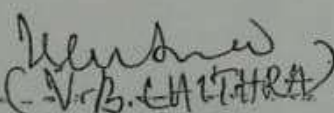
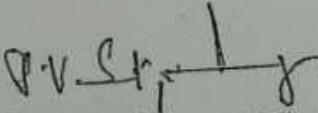
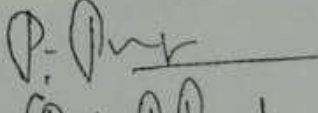
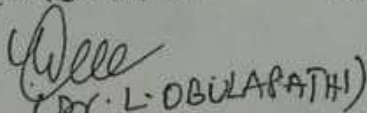
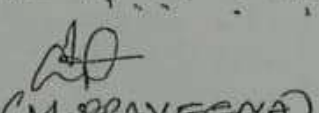
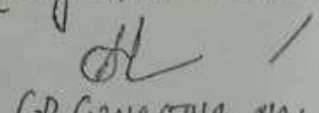
Course Outcomes: Student will be able to

1. Express himself/herself fluently in societal and professional contexts.
2. Describe methods for building professional image
3. Evaluate the situation and take necessary decisions.
4. Make presentations assertively and confidently
5. Create a productive workplace atmosphere using social and work-life skills.

Unit 1 Soft Skills: Introduction 9
Soft Skills: Introduction, need - Mastering Techniques of Soft Skills

Unit 2 Critical Thinking & Interview Skills 12
Active Listening – Observation - Analytical Thinking – Open-mindedness – Creative Thinking – Positive Thinking – Reflection
Resume Preparation: Structure, formats and styles -Projecting one's strengths and skills - Creative self-marketing - Sample resumes - Cover letter
Concept and process of Interviews - Body language - Answering strategies — FAQs in Job Interviews

Unit 3 Problem Solving & Decision Making 9
Effective Decision Making in teams: Methods & styles- GD Skills: Communicating views and opinions, Discussing, Intervening, Agreeing and Disagreeing —Asking for and Giving Clarifications - Substantiating one's views/points- Arriving at a Consensus on any given topic across a cross-section of individuals – Modulation and Clarity of voice - Body language

 (V.B. CHAITRA)
  (P.V. SRI)
  (P. PADMA)
 (DR. L. OBI LAPATHI)
 (M. PRAVEENA)
 (P. SUNEETHA)

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Unit 5 Corporate Etiquette & Emotional Intelligence

Minimum Requirements: Advanced English Language Communication Skills Lab

1. Mitra Barun K, *Personality Development and Soft Skills*. New Delhi: Oxford University Press, 2016.

1. Sharma, Prashant, Soft Skills: Personality Development for Life Success, BPB Publications 2018.
2. Alex K, Soft Skills, S.Chand & Co, 2012 (Revised edition)
3. Gajendra Singh Chauhan & Sangeetha Sharma, Soft Skills: An Integrated Approach to Maximize Personality Published by Wiley, 2013
4. Pillai, Sabina & Fernandez Agna, Soft Skills and Employability Skills, Cambridge University Press, 2018
5. Soft Skills for a Big Impact (English, Paperback, Renu Shorey) Publisher: Notion Press
6. Dr. Rajiv Kumar Jain, Dr. Usha Jain, Life Skills (Paperback, English) Publisher : Vayu Education of India, 2014.

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and society	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning
24AENG61.1	-	-	-	-	-	-	2	-	3	-	3
24AENG61.2	-	-	-	-	-	-	2	-	3	-	3
24AENG61.3	-	-	-	-	-	-	2	-	3	-	3
24AENG61.4	-	-	-	-	-	-	2	-	3	-	3
24AENG61.5	-	-	-	-	-	-	2	-	3	-	3

P.V. Sridhar
 CPVC NARAYAN
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 (P. Padma)



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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Embedded Systems
Category : PC
Year : III
Semester : II
Course Code : 24AECE61T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To provide basic concepts, architecture, and applications of embedded systems.
2. To analyze hardware, software, development process, and communication interfaces of embedded systems

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the concepts, architecture, classifications, applications of embedded systems.
2. Analyze embedded system hardware architecture and platforms, including microcontroller-based systems.
3. Comprehend software architecture and basic principles of real-time operating systems used in embedded systems.
4. Analyze the embedded system development process.
5. Analyze and select appropriate communication interfaces for embedded system applications.

Unit 1 INTRODUCTION TO EMBEDDED SYSTEMS 10

Embedded System – Definition, Application Areas, Categories, Overview of Embedded System Architecture, Specialties, Recent trends.

Unit 2 HARDWARE ARCHITECTURE & PLATFORMS 12

Hardware Architecture – CPU, Memory, Clock Circuitry, Watch dog Timer/Reset Circuitry, chip select, I/O devices, Debug Port, Power supply, types of hardware platforms, 89c51 Micro-controller development board.

Unit 3 SOFTWARE ARCHITECTURE 10

Software Architecture – Services provided by an operating System, Architecture and categories of Embedded Operating Systems, Application Software, Communication software, Process of generating Executable image, Development/Testing tools.

Unit 4 THE PROCESS OF EMBEDDED SYSTEM DEVELOPMENT 10

The Development Process, Requirements Engineering, Design: Design Tradeoffs ,Co-design, Hardware Design, software Design, Implementation, Integration and testing.

Unit 5 COMMUNICATION INTERFACES 10

Need for Communication interface, RS232/UART, RS 422/RS 485, SPI, USB, Infrared, IEEE 1394 fire wire, IEEE 802.11, Bluetooth, I2C.

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Prescribed Textbooks:

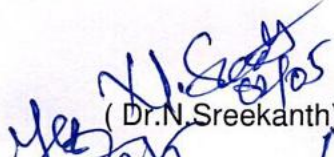
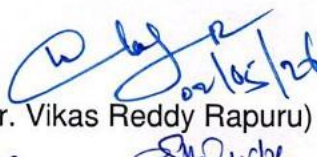
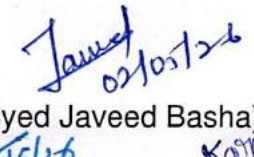
1. Embedded/ Real Time Systems, K.V.K.K. Prasad, Dream tech press.

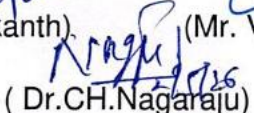
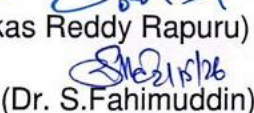
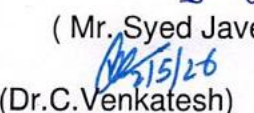
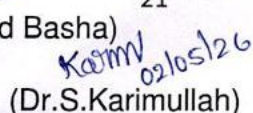
Reference Books:

1. Embedded Systems, Raj Kamal, TMH. 2nd edition.2008.,Pearson Ed.,2005
2. An Embedded system Primer-David E.Simon.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE61T.1	3	2	1	1	-	-	-	-	-	-	2	2	1
24AECE61T.2	3	3	2	1	2	-	-	-	-	-	1	3	2
24AECE61T.3	3	2	1	1	2	-	-	-	-	-	2	2	1
24AECE61T.4	2	3	3	2	2	-	-	2	1	2	2	3	2
24AECE61T.5	2	3	2	2	3	1	-	-	1	-	2	2	3

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Microwave Engineering
Category : PC
Year : III
Semester : II
Course Code : 24AECE62T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To provide a strong foundation in microwave frequency electromagnetic wave theory, waveguides, and modes of propagation for engineering applications.
2. To familiarize students with microwave components, devices, and sources, including waveguide junctions, ferrite devices, microwave tubes, and solid-state devices.
3. To develop the ability to analyze and measure microwave system parameters.

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the microwave frequency range, its applications, and Explain wave propagation, TE/TM modes, cutoff frequency, and field patterns in rectangular waveguides.
2. Analyze TE and TM mode propagation in circular waveguides and comprehend the working, resonant frequency, and Q-factor of cavity resonators.
3. Apply S-matrix concepts to analyze microwave junctions and explain the working of passive microwave components and ferrite devices.
4. Explain and comprehend the construction, working principles, and performance characteristics of microwave tubes such as klystrons, TWTs, and magnetrons.
5. Comprehend and explain the operation of solid-state microwave devices and perform microwave measurements using standard techniques.

Unit 1 Introduction to Microwave Engineering & Wave Guides: Rectangular Waveguides 14

Introduction to Microwave engineering, Microwave Spectrum and Bands, Advantages & Applications of Microwaves. Wave guides- Types, Rectangular Waveguides – TE/TM mode analysis, Dominant and Degenerate Modes. Mode Characteristics – Phase and Group Velocities, Wavelengths and Impedance Relations, Impossibility of TEM mode

Unit 2 Circular Waveguides 10

Propagation of TE & TM waves, Nature of Fields, Characteristic Equation, TM modes, Dominant and Degenerate Modes, Attenuation, Advantages and Applications. Cavity Resonators– Introduction, Rectangular and Cylindrical Cavities, Dominant Modes and Resonant Frequencies, Q factor and Coupling Coefficients.

Unit 3 Microwave Components 12

Waveguide Microwave Junctions Formulation and Properties of S-Matrix, Microwave T-Junctions-H-Plane, E-Plane, Magic Tee and its Applications. Directional Couplers-Two Hole, Wave guide Irises- Posts & Tuning screws, Coupling Probes and loops, Waveguide Terminations, Phase Shifters and Microwave attenuators, Ferrite Devices Faraday Rotation Microwave devices- Gyrator, Isolator, Circulator

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(Dr.J.Chinna Babu) (Dr.CH.Nagaraju) (Dr. S.Fahimuddin) (Dr.C.Venkatesh) (Dr.S.Karimullah)
02/05/26 02/05/26 02/05/26 02/05/26 02/05/26

Unit 4 Microwave Sources-Klystrons, TWT's, Magnetrons**14**

Limitations and Losses of conventional tubes, Microwave tubes– classifications, Two Cavity Klystrons – Structure, Reentrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process, Expressions for output Power and Efficiency. Reflex Klystrons – Structure, Applegate Diagram and Principle of working, Mathematical Theory of Bunching, Power Output, Efficiency, Electronic Admittance. TWT's- Construction, Principle and working Operation, Mathematical Analysis, Performance and Applications. Magnetron-Introduction, Cavity Magnetron, Mathematical Analysis, Sustained oscillations, Mode jumping, Frequency Pushing and pulling, Performance Characteristics and Applications

Unit 5 Microwave Solid State Devices & Measurements**10**

Introduction, TED's, Gunn Effect Diodes (GaAs), RWH Theory-Differential Negative Resistance, Two Valley Model Theory, Modes of Operation. Avalanche Transit Time devices- Introduction, IMPATT and TRAPATT Diodes-Structure, Principle of Operation, Power output and Efficiency. Microwave Measurements- Description of Microwave Bench-Different Blocks and their Features, Precautions; Microwave Power Measurement – Bolometer Method. Measurement of Attenuation, Frequency, VSWR, Cavity Q, Impedance Measurements.

Prescribed Textbooks:

1. Samuel Y. Liao, PHI- Microwave Devices and Circuits, 3rd Edition, 2003

Reference Books:

1. Microwave and Radar Engineering, M Kulkarni– Umesh Publications, 1998
2. R.E. Collin - Foundations for Microwave Engineering, IECE Press, John Wiley, 2nd Edition, 2002
3. Herbert J. Reich, J.G. Skolnik, P.F. Ordung and H.L. Krauss - Microwave Principles, CBS Publishers and Distributors, New Delhi, 2004.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE62T.1	3	2	1	1	-	-	-	-	-	-	1	2	-
24AECE62T.2	3	3	1	2	-	-	-	-	-	-	1	2	-
24AECE62T.3	3	3	2	1	-	-	-	-	-	-	1	3	-
24AECE62T.4	3	2	1	1	-	-	-	-	-	-	1	2	-
24AECE62T.5	3	2	2	3	2	-	-	-	-	-	1	2	2

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Digital Signal Processing
Category : PC
Year : III
Semester : II
Course Code : 24AECE63T
Branch/es : ECE

Lecture Hours

3

Tutorial Hours

0

Practice Hours

0

Credits

3

Course Objectives:

1. Comprehend fundamentals of discrete-time signals and systems.
2. Analyze signals using Fourier and FFT techniques.
3. Design and implement digital filters.
4. Apply multirate DSP concepts and applications.

Course Outcomes:

At the end of the course, the student will be able to

1. Analyze discrete-time signals and LTI systems using DFT concepts.
2. Compute DFT efficiently using Radix-2 FFT algorithms.
3. Design and realize IIR and FIR digital filters
4. Apply multirate DSP techniques for sampling rate conversion
5. Apply DSP techniques to real-world signal processing applications. Understand different number systems conversions & Binary codes

Unit 1 Introduction and Discrete Fourier Series

12

Discrete time signals, LTI systems, stability and causality, Solution of linear constant coefficient difference equations. Z-Transform: Definition, ROC, Properties, Poles and Zeros in Z-plane, the inverse Z-Transform, System analysis, Transfer function. Properties of discrete Fourier series.

Unit 2 Discrete and Fast Fourier Transforms

12

Discrete Fourier transforms: properties of DFT, linear convolution of sequences using DFT, computation of DFT. Fast Fourier transforms (FFT)-Radix2 decimation in time and decimation in frequency FFT algorithms, inverse FFT.

Unit 3 IIR and FIR Digital Filters

12

Introduction to digital filters, Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters by Impulse invariant and bilinear transformation methods, Basic structures of IIR Filters - Direct form-I, Direct form-II, Cascade form and Parallel form realizations. Design of FIR filters using windowing methods (Rectangular, Triangular, Raised Cosine, Hanning, Hamming, Blackman), Basic structures of FIR Filters – Direct form, Cascade form, Comparison of IIR & FIR filters.

Unit 4 Multirate Digital Signal Processing Fundamentals

12

Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Filter Design and Implementation for Sampling rate conversion, Multistage implementation of Sampling rate conversion.

Unit 5 Applications of Digital Signal Processing

12

Spectral analysis of non-stationary Signals, Musical Sound processing, Signal Compression, Oversampling A/D Converter, Oversampling D/A Converter.

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(Mr. Syed Javeed Basha)

24

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(Dr.C.Venkatesh)

(Dr.S.Karimullah)

Prescribed Textbooks:

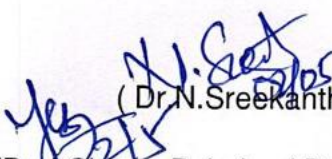
1. Digital Signal Processing, A computer base approach- Sanjit K Mitra, Tata McGraw Hill, 3rd edition, 2009

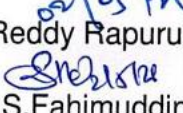
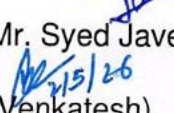
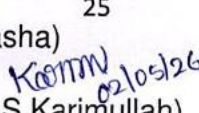
Reference Books:

1. Discrete Time Signal Processing-A.V. Oppenheim and R.W. Schaffer, 2nd ed., PHI.
2. Digital Signal Processing- P. Ramesh Babu, 4th Ed. SciTech Publications

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE63T.1	2	3	2	2	-	2	-	-	2	-	2	3	-
24AECE63T.2	2	3	2	2	-	2	-	-	2	-	2	2	-
24AECE63T.3	2	3	3	2	-	2	-	-	2	-	2	2	2
24AECE63T.4	2	2	2	2	-	2	-	-	2	-	2	2	2
24AECE63T.5	2	2	2	2	-	2	-	-	2	-	2	-	-

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  (Mr. Syed Javeed Basha)
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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course: Electronic Measurements and Instrumentation
Category : PE
Year : III
Semester : II
Course Code : 24AECE6AT
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. Give the knowledge on instrument usage for a particular application.
2. Explain the internal structure of all instruments that are used in measuring parameters related to electronic based systems
3. To study and apply modern measurement techniques and transducers

Course Outcomes:

At the end of the course, the student will be able to

1. State the principles of measurements with different basic meters and calculate all the parameters related to measurements.
2. Describe different types of signal generators and Signal analyzers.
3. Explain the basic features of oscilloscope, its internal architecture and different types
4. Design different types of bridges for signal conditioning purpose.
5. Comprehend about different types of transducers and advancements in Instrumentation.

Unit 1 Measurement Systems and Electrical Measuring Instruments

12

Generalized measurement system, Accuracy, Precision, Resolution. Errors in Measurement. Basics of statistical analysis, D'Arsonval galvanometer, PMMC mechanism. DC Ammeter. DC voltmeter. Series Ohmmeter, shunt Ohmmeter. Volt-Ohm-Milli ammeter. Digital voltmeters (DVMs): Ramp type & dual slope integrator, Digital Multimeter

Unit 2 Signal Generators & Analyzers

10

Audio frequency signal generation, Sine-wave generator, frequency-Synthesized signal generator, frequency divider generator, signal generator modulation, Sweep frequency generator, pulse and square wave generators. Function generator. Wave analyzers, Harmonic distortion analyzers, Spectrum Analyzers. Simple Frequency counter.

Unit 3 Oscilloscopes and Waveform Analysis

12

Oscilloscope block diagram, Cathode Ray Tube, deflection amplifiers, oscilloscope time base, dual trace oscilloscope, and oscilloscope controls. Measurement of voltage, frequency and phase. display of device characteristics, X-Y and Z displays, Sampling Oscilloscopes, Digital Storage Oscilloscope (DSO): Architecture and memory systems, Advanced triggering techniques, Signal integrity issues in oscilloscope measurements, Applications of DSO in mixed-signal measurements, Oscilloscope specifications and performance.

Unit 4 Review of AC & DC Bridges

9

Wheatstone bridge, guarded Wheatstone bridge, Kelvin Bridge, AC bridges and their application, Maxwell's bridge, Hays Bridge. Schering Bridge. Wein Bridge. Q-meter.

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Unit 5 Transducers and Sensors**8**

Active and passive transducers-Measurement of displacement (Resistance, capacitance, inductance; LVDT) Force (strain gauges) Pressure (piezoelectric transducers) -Temperature (resistance thermometers, thermocouples, and thermistors)- Velocity- Acceleration-Vibration.

Prescribed Textbooks:

1. Electronic Instrumentation and Measurements, Third edition – David A. Bell, Eastern Economy Edition, PHI, 2013.

Reference Books:

1. Electronic instrumentation, Third edition - H.S. Kalsi, Tata McGraw Hill, 2018
2. Modern Electronic Instrumentation and Measurement Techniques – A.D. Helfrick and W.D. Cooper, PEARSON Education
3. A course in electrical and electronic measurements and instrumentation. A.K. Sawhney., Dhanat Rai& Co publishers.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE6AT.1	3	3	2	3	3	-	-	-	-	-	3	3	3
24AECE6AT.2	3	3	2	3	3	-	-	-	-	-	3	3	3
24AECE6AT.3	3	2	1	2	3	-	-	-	-	-	2	3	2
24AECE6AT.4	3	3	2	3	3	-	-	-	-	-	3	3	3
24AECE6AT.5	3	3	2	3	3	-	-	-	-	-	3	3	3

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Digital System Design
Category : PE
Year : III
Semester : II
Course Code : 24AECE6BT
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

At the end of the course, the student will be able to

1. Understand the fundamentals of digital system design using ASM charts, HDL, and state tables.
2. Design and analyze synchronous sequential circuits using ROMs and PLAs.
3. Analyze fault models and apply test generation techniques for combinational circuits.
4. Design fault diagnosis experiments for sequential circuits and PLAs.
5. Analyze asynchronous sequential machines and identify hazards and races.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain ASM charts, HDL descriptions, state tables, and state reduction techniques.
2. Design synchronous sequential circuits using ROMs, PLAs, and iterative logic structures.
3. Analyze digital circuits for different fault models and generate tests using standard fault detection algorithms.
4. Design and evaluate fault detection and diagnosis experiments for sequential circuits and PLAs.
5. Analyze asynchronous sequential machines and identify hazards, races, and stable states.

Unit 1 Design of Digital Systems and Sequential Circuits 12

ASM charts, Hardware description language and control sequence method, Reduction of state tables, state assignments, design of Iterative circuits, design of sequential circuits using ROMs and PLAs.

Unit 2 Fault Modeling and Test Generation Algorithms 12

Fault classes and models – Stuck at faults, bridging faults, transition and intermittent faults. Fault diagnosis of Combinational circuits by conventional methods – Path Sensitization technique, Boolean difference method, Kohavi algorithm. D – Algorithm, PODEM, Random testing, transition count testing, Signature analysis and testing for bridging faults

Unit 3 Fault Diagnosis in Sequential Circuits 12

State identification and fault detection experiment. Machine identification, Design of fault detection experiment

Unit 4 Programming Logic Arrays & Testing 12

Design using PLA's, PLA minimization and PLA folding. Fault models, Test generation and Testable PLA design.

Unit 5 Asynchronous Sequential Machine 12

Fundamental mode model, flow table, state reduction, minimal closed covers, races, cycles and hazards.

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Prescribed Textbooks:

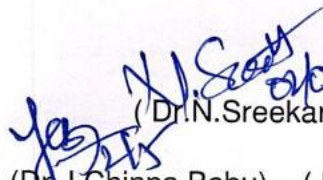
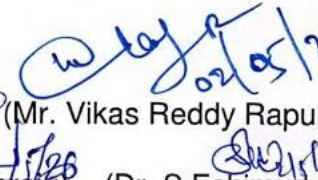
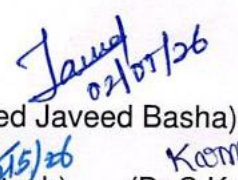
1. Z. Kohavi – "Switching & finite Automata Theory" (TMH)

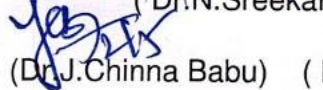
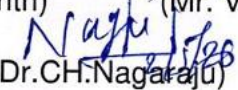
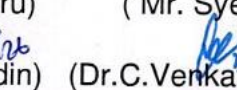
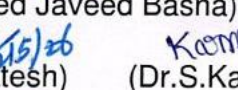
Reference Books:

1. M. Abramovici, M. A. Breues, A. D. Friedman – "Digital System Testing and Testable Design", Jaico Publications
2. Charles H. Roth Jr. – "Fundamentals of Logic Design".

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE6BT.1	3	2	1	1	1	-	-	-	-	-	-	3	-
24AECE6BT.2	3	2	3	1	2	-	-	-	-	-	-	2	3
24AECE6BT.3	2	3	1	3	2	-	-	-	-	-	-	-	2
24AECE6BT.4	2	3	2	3	2	-	-	-	-	-	-	1	3
24AECE6BT.5	2	3	1	2	-	-	-	-	-	-	1	-	-

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Radar Engineering
Category : PE
Year : III
Semester : II
Course Code : 24AECE6CT
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To learn the fundamental operation and working principles of modern radar systems.
2. To comprehend the basic concepts of modern radar systems for both civilian and defense applications.
3. To learn various signal detection techniques, displays and duplexers used in radar systems

Course Outcomes:

At the end of the course, the student will be able to

1. Comprehend the essential principles of operation and fundamentals of radar systems
2. Gain in-depth knowledge about the different types of RADARS.
3. Identify the various RADAR systems in existence, their applications and limitations
4. Comprehend the need for various signal detection techniques in RADAR systems.
5. Know the various technologies used in the design of RADAR systems such as duplexers, displays etc..

Unit 1 Radar Principles

12

Introduction, The simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies, Applications of radar, Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Signal-to-noise Ratio, Integration of Radar Pulses, Radar Cross Section of Targets (sphere, cone-sphere)

Unit 2 CW and Frequency Modulated Radar

9

Doppler Effect, CW Radar – Block Diagram, Isolation between Transmitter and Receiver, Applications of CW radar, FM-CW Radar-Range and Doppler Measurement, Block Diagram, FM-CW altimeter.

Unit 3 MTI and Pulse Doppler Radar

10

Introduction, Principle, MTI Radar with - Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers – Filter Characteristics, Blind Speeds, Double Cancellation, Range Gated Doppler Filters.

Unit 4 Tracking Radar

10

Tracking with Radar, Sequential lobing, Conical Scan, Monopulse Tracking Radar – Amplitude Comparison Monopulse (one coordinates), Phase Comparison Monopulse, Comparison of Trackers.

Unit 5 Detection of Radar Signals in Noise

10

Noise Figure, Noise figure of networks in cascade, Noise Temperature, Radar Displays – types, Duplexers – Branch type and Balanced type.

Prescribed Textbooks:

1. Introduction to Radar Systems – Merrill I. Skolnik, TMH Special Indian Edition, 2nd Edition, 2007

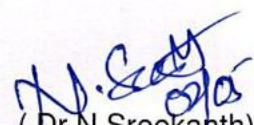
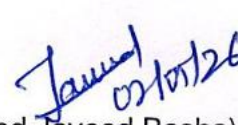
Reference Books:

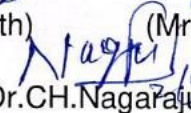
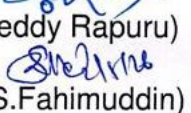
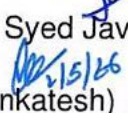
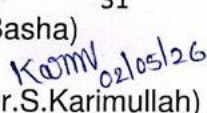
1. Radar Principles –Peebles, Jr., P.Z.Wiley, New York, 1998

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02/05/26

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE6CT. 1	1	3	3	1	-	-	2	-	1	2	3	2	-
24AECE6CT. 2	1	3	3	2	-	2	2	-	-	2	3	2	2
24AECE6CT. 3	1	3	3	3	-	2	2	-	-	3	3	1	-
24AECE6CT. 4	1	3	3	3	-	2	2	-	-	2	3	-	1
24AECE6CT. 5	1	3	3	2	1	-	2	-	-	2	3	1	-

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Introduction to Deep Learning
Category : PE
Year : III
Semester : II
Course Code : 24AECE6DT
Branch/es : ECE

Lecture Hours

3

Tutorial Hours

0

Practice Hours

0

Credits

3

Course Objectives:

1. Comprehend the basics of machine learning techniques.
2. Describe the designing model of deep feed forward networks
3. Implement efficient convolution algorithms
4. Comprehend various deep learning models such CNN, Autoencoders, RNN.
5. Apply the deep learning methods in real time applications

Course Outcomes:

At the end of the course, the student will be able to

1. Introduce students through some of the latest techniques in deep learning
2. Comprehend the internal designing of deep feed forward network and learning
3. Recognize convolution and recurrent neural networks.
4. Comprehend and apply different recurrent neural networks.
5. Hands on and the students should be able to design intelligent deep learning systems for solving the problems in the areas of their interests

Unit 1 Introduction

10

Machine Learning Basics: Learning algorithms, supervised and unsupervised, building a machine learning algorithm, and challenges motivating deep learning.

Unit 2 Regularization for Deep Learning

12

Regularization and Under Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multitask Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training, Optimization for Training Deep Models challenges in Neural Network Optimization, Basic Algorithms, Optimization Strategies and Meta-Algorithms

Unit 3 Convolutional Networks

11

The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, The Neuro-scientific Basis for Convolutional Networks, Convolutional Networks and the History of Deep Learning.

Unit 4 Sequence Modelling

10

Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks. Long short-term memory

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Unit 5 Deep Generative models**12**

Deep Belief Networks, Variational Autoencoders, Generative Adversarial Networks, Deep Convolutional GAN Applications: Large-Scale Deep Learning, Computer Vision, Speech Recognition, Natural Language Processing, Other Applications.

Prescribed Textbooks:

1. Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning (Adaptive Computation and Machine Learning series), MIT Press

Reference Books:

1. Li Deng and Dong Yu, Deep Learning Methods and Applications, Foundations and Trends in Signal Processing Volume 7 Issues 3-4, ISSN: 1932-8346
2. Dr. N.D. Lewis, Deep Learning Made Easy with R A Gentle Introduction for Data Science. Create Space Independent Publishing Platform
3. François Chollet, JJ Allaire, MEAP Edition Manning Early Access Program Deep Learning with R Version 1, Copyright 2017 Manning Publications.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE6DT.1	3	3	3	3	-	-	-	-	-	-	-	2	3
24AECE6DT.2	3	2	3	2	-	-	-	-	-	-	-	-	3
24AECE6DT.3	3	3	2	3	-	-	-	-	-	-	-	3	2
24AECE6DT.4	3	2	2	2	-	-	-	-	-	-	-	2	-
24AECE6DT.5	2	3	3	3	3	-	-	-	-	-	-	3	3

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RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Biomedical signal processing
Category : PE
Year : III
Semester : II
Course Code : 24AECE6ET
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

At the end of the course, the student will be able to

1. Understand the origin and types of biomedical signals.
2. Study acquisition systems and electrodes used in biomedical instrumentation.
3. Apply transform techniques for biomedical signal analysis.
4. Analyze biomedical signals using dimensionality reduction techniques.
5. Apply pattern recognition techniques for biomedical signal classification.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain different types and characteristics of biomedical signals.
2. Analyze biomedical signal acquisition systems and electrode characteristics.
3. Apply Fourier and wavelet transform techniques for biomedical signal analysis.
4. Analyze biomedical signals using PCA, ICA and other orthogonal transformations.
5. Classify biomedical signals using supervised and unsupervised learning methods.

Unit 1 Introduction to Biomedical Signal Processing 12

Introduction, Acquisition and generation of bio-signals, Origin of bio-signals, Types of bio-signals, Study of diagnostically significant bio-signal parameters, Action potential, Important epochs of ECG and EEG, Objectives of biomedical signal processing.

Unit 2 Electrodes and Signal Conditioning 12

Electrode, electrolyte interface, Polarization, Electrode-skin interface and motion artefacts, Biomaterials used for electrodes, Types of electrodes (body surface, internal, electrode arrays, microelectrodes), Practical aspects of electrode usage, Acquisition of bio-signals, Signal conditioning, ADCs and DACs, Processing considerations.

Unit 3 Transform Techniques 12

Biomedical signal processing using Fourier analysis, Spectral analysis of deterministic and stationary random signals, non-stationary signal analysis, Time-frequency analysis, Wavelet transform, Computation of diagnostically significant parameters – Classification of signals and noise.

Unit 4 Dimensionality Reduction Techniques 12

Principal Component Analysis (PCA), Correlation and regression, Analysis of chaotic signals, Multiresolution analysis (MRA), Wavelets, Independent Component Analysis (ICA), Noise separation techniques in biomedical signals.

Unit 5 Pattern Classification 12

Supervised and unsupervised classification, Neural Networks, Support Vector Machines (SVM), Hidden Markov Models (HMM), Applications in biomedical signal diagnosis and decision systems.

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Prescribed Textbooks:

1. R.M. Rangayyan, Biomedical Signal Analysis: A Case Study Approach, IEEE Press, John Wiley & Sons, 2002.

Reference Books:

1. C. Raja Rao and S.K. Guha, Principles of Medical Electronics and Biomedical Instrumentation, Universities Press, 2001.
2. W.J. Tompkins, Biomedical Digital Signal Processing, Prentice Hall, 1993.
3. Eugene N. Bruce, Biomedical Signal Processing and Signal Modeling, John Wiley & Sons, 2001
4. D.C. Reddy, Biomedical Signal Processing, McGraw Hill, 2005.
5. Duda, R.O., Hart, P.E., and Stork, D.G., Pattern Classification, John Wiley & Sons, 2012.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE6ET.1	3	2	3	2	1	-	-	-	-	-	-	3	2
24AECE6ET.2	3	3	3	2	1	-	-	-	-	-	-	2	3
24AECE6ET.3	2	3	2	3	2	-	-	-	-	-	-	3	2
24AECE6ET.4	2	2	3	2	3	-	-	-	-	-	-	2	-
24AECE6ET.5	2	3	2	2	2	-	-	-	-	-	1	2	-

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RAJAMPET, YSR Kadapa District, AP - 516126, INDIA

Title of the Course: GENDER SENSITIZATION
Category: AC
Course Code: 24AAUD51T
Branch/es: Common to all branches
Year: III B.Tech
Semester: I/II Semester

Lecture Hours
2

Tutorial Hours
0

Practice Hours
0

Credits
0

Course Objectives:

1. To enable students to understand the gender related issues, and foster humane attitude,
2. To familiarize them about constitutional safeguards for gender equality.
3. To expose students to debates on the politics and economics of work related discrimination.
4. To help students reflect critically on gender violence.
5. To make them understand gender identities and gender relations as part of culture.

Course Outcomes:

At the end of the course, the student will be able to

1. Understand the basic concepts of gender and its related terminology.
2. Identify the biological, sociological, psychological and legal aspects of gender.
3. Understand how gender discrimination prevails in our society and how to counter it.
4. Analyze the gender division of labor and its relation to politics and economics.
5. Appraise how gender-role beliefs and sharing behavior are associated with more well-being

Unit 1 UNDERSTANDING GENDER

6

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male.

Unit 2 GENDER ROLES AND RELATIONS

6

Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and its Consequences- Declining Sex Ratio- Demographic Consequences-Gender Spectrum.

Unit 3 GENDER AND LABOUR

7

Division and Valuation of Labor-Housework: The Invisible Labor- "My Mother doesn't Work". "Share the Load"- Unrecognized and Unaccounted work -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

(V.B. CHITRA)

(P.V. S. J. S.)
(Dr. P.V. NARAYANA)

(P. P. PAOMA)

(Dr. L. OBULAL)

(L. S. DANISHA)

(P. R. NARATHA NAIDU)

Unit 4 GENDER-BASED VIOLENCE

7

The Concept of Violence- Types of Gender-based Violence- Human Rights Perspective-Sexual Harassment - Domestic Violence - Different forms of violence against women - Causes of violence, impact of violence against women - Consequences of gender-based violence

Unit 5 GENDER AND CULTURE

6

Gender and Films-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Sensitive Language- Just Relationships

Prescribed Textbooks:

1. A.Suneetha, Uma Bhargubanda, et al. Towards a World of Equals: A Bilingual Textbook on Gender]], Telugu Akademi, Telangana, 2015.

Reference Books:

1. Watt, Robin and Masood, Nazia, Broken Mirrors: The dowry Problems in India, London : Sage Publications, 2011.
2. Datt, R. and Kornberg, J.(eds), Women in Developing Countries, Assessing Strategies for Empowerment, London: Lynne Rienner Publishers, 2002.

Online Learning Resources:

Understanding Gender chrome-extension:

https://onlinecourses.swayam2.ac.in/nou24_hs53/preview

Gender Roles and Relations

<https://www.plannedparenthood.org/learn/gender-identity/sex-gender-identity/what-are-gender-roles-and-stereotypes>

Gender and Labour

<https://www.economicsobservatory.com/what-explains-the-gender-division-of-labour-and-how-can-it-be-redressed>

GENDER-BASED VIOLENCE

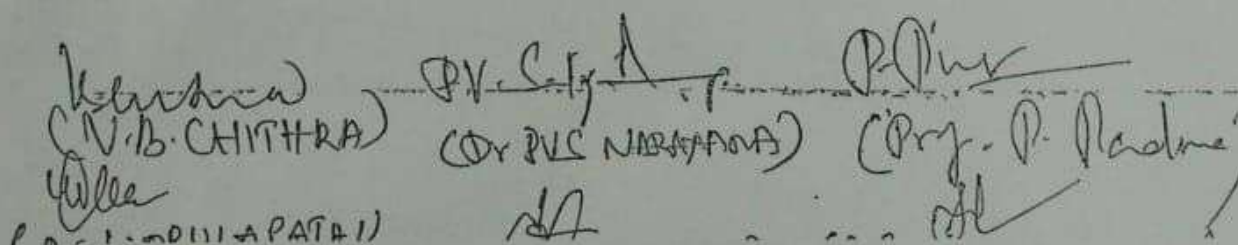
<https://eige.europa.eu/gender-based-violence/what-is-gender-based>

GENDER AND CULTURE

<https://gender.study/psychology-of-gender/culture-impact-gender-roles-identities/>

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and society	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning
24AAUD51T.1	-	-	-	-	-	-	3	-	1	-	-
24AAUD51T.2	-	-	-	-	-	-	3	-	1	-	-
24AAUD51T.3	-	-	-	-	-	-	3	-	1	-	-
24AAUD51T.4	-	-	-	-	-	-	3	-	1	-	-
24AAUD51T.5	-	-	-	-	-	-	3	-	1	-	-



 (N.B. CHITHRA) (Dr. P.V. NARAYANA) (Prof. P. Radhika)



ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Embedded Systems Lab
Category : PC
Year : III
Semester : II
Course Code : 24AECE61L
Branch/es : ECE

Lecture Hours

0

Tutorial Hours

0

Practice Hours

3

Credits

1.5

Course Objectives:

1. To learn the interfacing concepts of embedded systems.
2. To develop Embedded Applications

Course Outcomes:

At the end of the course, the student will be able to

1. Develop the Assembly Language Programs to perform Arithmetic and logical operations.
2. Interface LED, Seven Segment Display with Microcontrollers.
3. Analyze Serial communication with Microcontrollers
4. Design and implement interfacing of keyboard, buzzer, LCD, and elevator systems using the 8051 /ESP32/MSP430 micro-controllers
5. Develop real-time applications using microcontrollers.

LIST OF EXPERIMENTS: (Perform any 8 experiments)

1. Arithmetic Operations
2. Logical Operations
3. Switch and LED Interfacing
4. LCD Interfacing
5. Serial Transmission
6. Serial Reception
7. Keypad Interfacing
8. Elevator Interfacing
9. Seven segment Display
10. Buzzer Interfacing
11. GSM Interfacing.
12. Sorting RTOS
13. Analog Interfacing

(Dr.N.Sreekanth)

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(Mr. Syed Javeed Basha)

36

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(Dr.CH.Nagaraju)

(Dr. S.Fahimuddin)

(Dr.C.Venkatesh)

(Dr.S.Karimullah)

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE61L.1	3	3	3	3	-	-	-	-	-	3	-	-	-
24AECE61L.2	3	2	1	1	3	-	-	-	-	3	-	3	3
24AECE61L.3	3	2	1	1	3	-	-	-	-	3	-	3	3
24AECE61L.4	3	3	3	3	3	-	-	-	-	3	-	3	3
24AECE61L.5	3	3	3	3	3	-	-	-	-	3	-	3	3

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(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Microwave Engineering Lab
Category : PC
Year : III
Semester : II
Course Code : 24AECE62L
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

Course Objectives:

1. To familiarize students with microwave test bench setup and experimental procedures for analyzing the characteristics of microwave sources, components, and devices.
2. To enable students to perform standard microwave measurements, such as attenuation, VSWR, impedance, scattering parameters, and waveguide parameters.
3. To develop hands-on skills in testing, analyzing, and interpreting experimental results related to microwave components and antennas.

Course Outcomes:

At the end of the course, the student will be able to

1. Identify and explain the function, applications, and operating principles of microwave components such as klystron, Gunn diode, circulator, magic tee, and directional coupler.
2. Set up and interconnect microwave test bench components correctly and follow proper experimental procedures and safety precautions.
3. Perform microwave measurements including attenuation, VSWR, impedance using Smith chart, and waveguide parameters.
4. Determine and analyze scattering parameters (S-parameters) of microwave junctions such as circulator, magic tee, E-plane tee, and H-plane tee.
5. Analyze radiation characteristics and applications of horn antenna through experimental study.

LIST OF EXPERIMENTS: (Perform any 10 experiments)

1. Study of Reflex Klystron Characteristics.
2. Study of Gunn Diode Characteristics.
3. Study of Attenuation Measurement.
4. Verification of Directional Coupler Characteristics.
5. Determination of VSWR Measurement.
6. Impedance Measurement using smith chart
7. Waveguide parameters measurement
8. Scattering parameters of Circulator
9. Scattering parameters of Magic Tee.
10. Study of Horn Antenna
11. Scattering parameters of E plane Tee
12. Scattering parameters of H Plane Tee

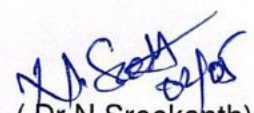
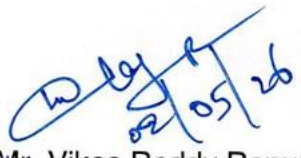
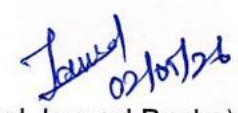
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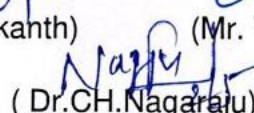
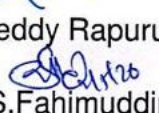
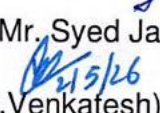
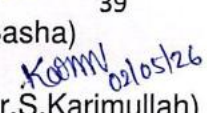
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(Dr. S.Fahimuddin)

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(Mr. Syed Javeed Basha)
(Dr.C.Venkatesh)
(Dr.S.Karimullah)

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE62L.1	3	1	1	1	2	-	-	-	-	-	1	2	-
24AECE62L.2	2	2	1	2	3	-	-	2	1	-	1	2	-
24AECE62L.3	3	3	1	2	3	-	-	-	-	-	1	2	2
24AECE62L.4	3	3	2	3	2	-	-	-	-	-	1	3	-
24AECE62L.5	3	2	1	2	2	-	-	-	-	-	1	2	-

 (Dr. N. Sreekanth)
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ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Y.S.R District, AP – 516126, INDIA

Title of the Course : Digital Signal Processing Lab
Category : PC
Year : III
Semester : II
Course Code : 24AECE63L
Branch/es : ECE

Lecture Hours
0

Tutorial Hours
0

Practice Hours
2

Credits
1

Course Objectives:

1. To analyze and verify LTI system properties and signal representations in time and frequency domains using MATLAB/SCI Lab
2. To design and implement digital filters, FFT algorithms and multirate signal processing techniques

Course Outcomes:

At the end of the course, the student will be able to

1. Analyze stability, causality, and frequency response of LTI systems.
2. Compute Fourier series, Fourier transform, and power spectral density of signals.
3. Implement linear and circular convolution and N-point FFT.
4. Design analog and digital IIR filters using standard methods.
5. Design and apply FIR filters and multirate signal processing techniques.

LIST OF EXPERIMENTS: (Perform any 10 experiments)

1. Generate the standard discrete time signals such as unit step, unit impulse, ramp, exponential and sawtooth.
2. Implement and verify autocorrelation for the given sequence and cross correlation between two signals
3. Verify linear convolution.
4. Verify the circular convolution.
5. N-point FFT algorithm
6. MATLAB/ SCI program to find frequency response of analog LP/HP filters.
7. Design Butterworth (LP/HP)
8. Design IIR filter by Impulse Invariant/Bi-Linear Transformation
9. Design FIR filter (LP/HP) using windowing technique
 - a) Using rectangular window
 - b) Using triangular window
 - c) Using Kaiser window
10. Compute power density spectrum of a sequence.
11. Decimation by a factor D
12. Interpolation by a Factor L

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(Dr. J. Chinnna Babu)

(Dr. CH. Nagaraju)

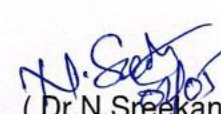
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(Dr. C. Venkatesh)

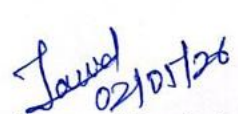
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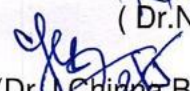
CO-PO Mapping:

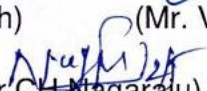
Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE63L.1	2	3	2	2	2	-	-	2	-	-	-	2	3
24AECE63L.2	2	3	2	2	3	-	-	2	-	-	-	2	2
24AECE63L.3	2	3	2	3	3	-	-	2	-	-	-	2	1
24AECE63L.4	2	3	2	3	3	-	-	2	-	-	-	2	2
24AECE63L.5	2	3	3	2	3	-	-	2	-	-	-	2	2

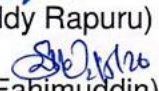

 (Dr. N. Sreekanth)

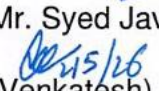

 (Mr. Vikas Reddy Rapuru)

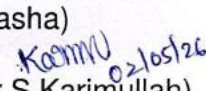

 (Mr. Syed Javeed Basha)


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 (Dr. S. Fahimuddin)


 (Dr. C. Venkatesh)


 (Dr. S. Karimullah)



ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: Java Programming
Category: Skill Course
Course Code: 24ACSE65S
Year: III B. Tech
Semester: II Semester
Branch: ECE

Lecture Hours
1

Tutorial Hours
0

Practice Hours
2

Credits
2

Course Objectives: This course will be able to

1. Understand the basic concepts of java programming.
2. Analyze and apply concepts like packages, interfaces, and exception handling.
3. Implement the multi-threading and GUI applications developed using JAVA

Course Outcomes: At the end of the course, the student will be able to

1. Understand the importance of datatypes, operators, functions, arrays and strings in Java Programming.
2. Apply reusability concepts like Inheritance, interfaces and packages in real time applications developed using JAVA
3. Relate the abstract class and interfaces in java programming
4. Construct and classify error and exception handling
5. Implement genetics and JavaFX basic concepts in java programs

Unit 1 Introduction to Java Programming

12

Introduction to Java: Install Java & Java IDE, First Java Program, Variables and Data Types in Java, Operators in Java, Flow Control Statements in Java, functions in java, arrays in java, Strings in java

Unit 2 Object Oriented Programming

9

Object-Oriented Programming, Classes and Objects, Encapsulation, Abstraction, Inheritance, polymorphism.

Unit 3 Packages and Interfaces

10

Packages and Interfaces: Packages, Defining a Package, A Short Package Example, Access Protection, an Access Example, Importing Packages. Abstract keyword, Interfaces: Defining an Interface, Implementing Interfaces, Nested Interfaces, Applying Interfaces, Variables in Interfaces, Interfaces Can Be Extended

Vani
(Haquevalle)

Raf.
(S.M.Rafi)

D. Srike
(D. Srike)

V. Sathyashankar
S2

S. Ma
(B. N. Ma)

P. Bal
B. Bal
Chakravarthy

Unit 4 Exception Handling and Multithreaded Programming

12

Exception Handling: Exception-Handling Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch, Displaying a Description of an Exception, Multiple catch Clauses, Nested try Statements, throw, throws, finally, Built-in Exceptions

Multithreaded Programming: The Java Thread Model, Thread Priorities, Synchronization, Messaging, The Thread Class and the Runnable Interface, The Main Thread, Creating a Thread, Implementing Runnable, Extending Thread, Choosing an Approach, Creating Multiple Threads

Unit 5 Generics and JavaFX Basics

10

Generics: What Are Generics, Generics Work Only with Reference Types, A Generic Class with Two Type Parameters, The General Form of a Generic Class.

JavaFX Basic Concepts, Using Image and Image View, Button, Radio Button, CheckBox, TextField

Prescribed Text Book:

1. Herbert Schildt. Java. The complete reference, TMH, 9th Edition

Reference Books:

1. Nino and F.A. Hosch, An Introduction to programming and OO design using Java, John Wi & sons.
2. Y. Daniel Liang, Introduction to Java programming, Pearson Education. 6th Edition
3. R.A. Johnson- Thomson, An introduction to Java programming and object-oriented Application Development

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
24ACSE36L-1	3	3	-	-	-	-	-	-	-	-	-	-	2	-
24ACSE36L-2	-	3	3	2	-	-	-	-	-	-	-	-	3	-
24ACSE36L-3	3	3	3	2	-	-	-	-	-	-	3	3	2	-
24ACSE36L-4	3	3	3	-	-	-	-	-	-	-	3	3	3	-
24ACSE36L-5	3	3	3	-	-	-	-	-	-	-	3	3	3	3

Vini
(Karpaga Valsi)

Raf
(S.M.Rafi)

B. Naveen Kumar

V. Sathya Kumar
S.D.

D. Sarika
(D. Sarika)

B. Dilip
Chakravarthy



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RAJAMPET, YSR District, AP – 516126, INDIA

ANNEXURE -2



ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Y.S.R District, AP – 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (R24 regulations)

B.Tech. VII Semester (IV Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	24AECE71T	Digital Image Processing	3	0	0	3
2	PE-III	24AECE7AT	DSP Processors and Architectures	3	0	0	3
3		24AECE7BT	Coding theory & Techniques				
4		24AECE7CT	Advanced VLSI Design & Verification				
5		24AECE7DT	Embedded Systems for Robotics				
6		24AECE7ET	Cellular & Mobile communications				
7	PE-IV	24AECE7FT	Satellite Communication	3	0	0	3
8		24AECE7GT	FPGA Architectures & Applications				
9		24AECE7HT	Computer Networks				
10		24AECE7IT	Advanced Digital signal processing				
11		24AECE7JT	Remote Sensing Systems				
12	PE-V	24AECE7KT	Edge AI & Intelligent Systems	3	0	0	3
13		24AECE7LT	Optical Fiber Communication				
14		24AECE7MT	5G/6G Communication Technologies				
15		24AECE7NT	Image & Video processing				
16		24AECE7OT	Digital IC Design				
17	OE-III	24AECE7PT	Data Communications & Networks	3	0	0	3
18		24AECE7QT	IC design for sensor Networks				
19		24AECE7RT	Embedded Real time Systems				
20		24AECE7ST	Testing and Testability				
21	OE-IV	24ACIV7MT	Disaster Management	3	0	0	3
22		24ACIV7NT	Water Resources and Harvesting				
23		24AECE7TT	Sustainable Energy Sources				
24		24AECE7UT	Electric Vehicles				
25		24AMEC7GT	Entrepreneurship Development				
26		24AMEC7HT	Optimization Techniques				
27		24ACSE7QT	Database Management Systems				
28		24ACSE7RT	Operating Systems				
29		24AAID7MT	Introduction to Data Science				
30		24AAIM71T	Introduction to Cyber Security				
31		24AMBA71T	Human Resource Management				
32		24AMBA72T	Startup Management				
33		24ACHE71T	Chemistry of Energy systems				
34		24AMAT71T	Numerical Methods				
35		24AENG71T	English for Competitive Examinations				
36		24APHY71T	Smart Materials and Devices				
37	SEC	24AECE71L	IOT based Embedded System design	1	0	2	2
38	INTERN	24AECE7WI	Industrial Internship (2 Months) to be evaluated during VII semester	0	0	0	2
Total credits							22

(Dr. N. Sreekanth) (Mr. Vikas Reddy Rapuru) (Mr. Syed Javeed Basha)
 (Dr. J. Chinna Babu) (Dr. CH. Nagaraju) (Dr. S. Fahmuddin) (Dr. C. Venkatesh) (Dr. S. Karimullah)



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RAJAMPET, Y.S.R District, AP – 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (R24 regulations)

Category	Credits
Program Core Course	03
Program Elective Course	09
Open Elective Course	06
Skill oriented course	02
Internship	02
Total Credits	22

B.Tech. VIII Semester (IV Year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PROJ	24AECE81P	Project work	0	0	0	12
Total credits							12

Subjects Offered to other Departments

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	OE-IV	24AECE7TT	Introduction to Communication Systems	3	0	0	3
2		24AECE7UT	Introduction to Microprocessors & Microcontrollers	3	0	0	3
3		24AECE7VT	Introduction to Image Processing	3	0	0	3

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RAJAMPET, YSR District, AP – 516126, INDIA

ANNEXURE -3



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(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, YSR District, AP – 516126, INDIA

Title of the Course : Signals and Systems
Category : PC
Year : II
Semester : I
Course Code : 24AECE31T
Branch/es : ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To do analysis of signals & systems (continuous and discrete) using time domain & frequency domain methods.
2. To acquire practical knowledge on various transform techniques in the analysis of signals and systems.
3. To acquire knowledge of LTI Systems and Sampling Concepts.
4. To study the various convolution in communication systems.

Course Outcomes:

At the end of the course, the student will be able to

1. Understand signal representation methods and operations on signals.
2. Have the knowledge to obtain Fourier series and Fourier Transforms
3. Learn LTI Systems and Sampling Concepts.
4. Understand the convolution and correlation of signals.
5. Analyze different transforms (Laplace & Z) and their responses with different types of signals.

Unit 1 Introduction to Signals and Systems

12

Continuous time Signal and Discrete time Signals, Elementary Continuous and Discrete time signals, Basic Operations on Signals, Classification of Signals, Concept of Systems, Representation of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Fourier spectrum, Gibbs Phenomenon, properties of Fourier series.

Unit 2 Fourier Transforms

12

Deriving Fourier transform from Fourier series, Fourier transform of standard signals, properties of Fourier transforms Fourier transform of periodic signals, Introduction to Hilbert Transform.

Unit 3 LTI Systems and Sampling

12

LTI systems, Properties & Transfer function, Filter Characteristics, Distortion less Transmission through a system, signal and system bandwidth, Ideal filter characteristics, Causality and Paley-Wiener Criterion, Relationship between Bandwidth and Rise Time.

Sampling theorem—Graphical and analytical proof for Band Limited Signals, effect of under sampling—Aliasing Sampling Techniques, data Reconstruction, Sampling of Bandpass signals.

Unit 4 Convolution and Correlation

12

Convolution: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms.

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(Dr. C. Venkatesh)

(Dr. S. Karimullah)

Correlation: Cross correlation and autocorrelation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between autocorrelation function and energy/power spectral density function. Relation between convolution and correlation.

Unit 5 Laplace Transforms

12

Laplace Transforms-Introduction, Region of Convergence, L.T's of some commonly used signals, Properties, Inverse Laplace Transforms.

Prescribed Textbooks:

1. B.P.Lathi -Signals, Systems & Communications--BS Publications, 2003
2. A.V.Oppenheim, A.S.Willsky and S.H.Nawab-Signals and Systems--PHI, 2nd Edition

Reference Books:

1. Simon Haykin and VanVeen, Wiley-Signals & Systems--2nd Edition.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-long Learning	PSO1	PSO2
24AECE31T.1	3	1	1	1	-	-	1	-	-	-	1	3	-
24AECE31T.2	1	3	-	2	-	1	-	-	-	-	1	-	-
24AECE31T.3	1	-	2	3	1	-	-	-	1	-	3	-	-
24AECE31T.4	3	1	-	-	2	-	1	1	-	-	3	-	-
24AECE31T.5	1	1	-	2	-	3	1	-	1	-	3	1	-

N. Sreekanth
(Dr.N.Sreekanth) 02/05/26

Vikas Reddy Rapuru
(Mr. Vikas Reddy Rapuru) 02/05/26

Jameel
(Mr. Syed Javeed Basha) 02/05/26

J. Chinnna Babu
(Dr.J.Chinnna Babu) 02/05/26

CH. Nagaraja
(Dr.CH.Nagaraja) 02/05/26

S. Fahimuddin
(Dr. S.Fahimuddin) 02/05/26

Dr. C. Venkatesh
(Dr.C.Venkatesh) 02/05/26

Karim
(Dr.S.Karimullah) 02/05/26



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ANNEXURE -4



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Courses Mapped with SDGs, CCI & IKS

S.No.	Name of the Course	Year & Sem	Category	Relevant SDG No.	Justification
1	Internet of Things	III B.Tech. I Sem	SDG	SDG 9, SDG 11	Smart infrastructure, smart cities
2	Control Systems	III B.Tech. I Sem	SDG / IKS	SDG 7, SDG 12	Energy efficiency, automation
3	Technical Paper Writing & IPR	III B.Tech. I Sem	CCI / IKS	SDG 4	Education, ethics, IPR, knowledge protection
4	Soft Skills	III B.Tech. I Sem	CCI	SDG 4	Employability, communication skills
5	Summer Internship	III B.Tech. I Sem	CCI	SDG 8	Industry exposure, decent work
6	Biomedical Signal Processing	III B.Tech. II Sem	SDG / IKS	SDG 3	Healthcare systems, link to traditional health concepts
7	Radar Engineering	III B.Tech. II Sem	SDG	SDG 13	Climate monitoring, disaster management
8	Gender Sensitization	III B.Tech. II Sem	CCI	SDG 5	Gender equality & social awareness

(Signature)
(Dr.N.Sreekanth)

(Signature)
(Mr. Vikas Reddy Rapuru)

(Signature)
(Mr. Syed Javeed Basha)

(Signature)
(Dr.J.Chinna Babu)

(Signature)
(Dr.CH.Nagaraju)

(Signature)
(Dr. S.Fahimuddin)

(Signature)
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(Signature)
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ANNEXURE -5



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

AURAT SYLLABUS

UNIT-I: ENGINEERING MATHEMATICS

Linear Algebra: Vector space, basis, linear dependence and independence, matrix algebra, Eigen values and eigen vectors, rank, solution of linear equations- existence and uniqueness.

Calculus: Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series.

Differential Equations: First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.

Vector Analysis: Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stokes' theorems.

Complex Analysis: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, sequences, series, convergence tests, Taylor and Laurent series, residue theorem.

UNIT-II: NETWORKS, SIGNALS & SYSTEMS

Circuit analysis: Node and mesh analysis, superposition, Thevenin's theorem, Norton's theorem, reciprocity. Sinusoidal steady state analysis: phasors, complex power, maximum power transfer. Time and frequency domain analysis of linear circuits: RL, RC and RLC circuits, solution of network equations using Laplace transform., Linear 2-port network parameters, wye-delta transformation.

Continuous-time signals: Fourier series and Fourier transform, sampling theorem and applications.

Discrete-time signals: DTFT, DFT, z-transform, discrete-time processing of continuous-time signals. LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeroes, frequency response, group delay, phase delay.

UNIT-III: ANALOG AND DIGITAL ELECTRONICS

Basics of Electronic Devices: P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell.

Diode circuits: clipping, clamping and rectifiers.

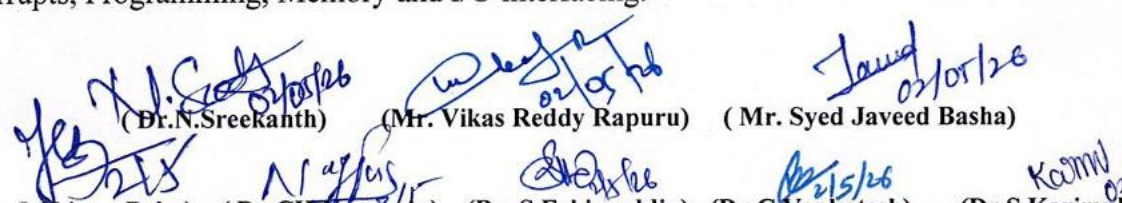
BJT and MOSFET amplifiers: biasing, ac coupling, small signal analysis, frequency response.

Op-amp circuits: Amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers and oscillators.

Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, multiplexers, decoders.

Sequential circuits: latches and flip-flops, counters, shift-registers, finite state machines,

Introduction of Microprocessor 8086: Architecture, addressing modes, instruction set, interrupts, Programming, Memory and I/O interfacing.


(Dr.N.Sreekanth) (Mr. Vikas Reddy Rapuru) (Mr. Syed Javeed Basha)
(Dr.J.Chinna Babu) (Dr.CH.Nagaraju) (Dr. S.Fahimuddin) (Dr.C.Venkatesh) (Dr.S.Karimullah)



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UNIT-IV: COMMUNICATIONS

Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, super heterodyne receivers.

Information theory: entropy, mutual information and channel capacity theorem.

Digital communications: PCM, DPCM, digital modulation schemes (ASK, PSK, FSK, QAM), bandwidth, inter-symbol interference, Fundamentals of error correction, Hamming codes.

Optical communication: Optical sources - LED, spontaneous and stimulated emission, semiconductor Lasers, Detectors – PIN photodiodes, Avalanche photodiodes (APD), Optical fibers – attenuation and dispersion characteristics.

UNIT-V: ELECTROMAGNETICS

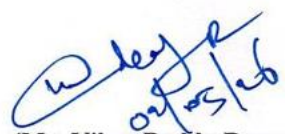
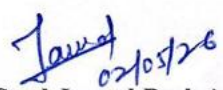
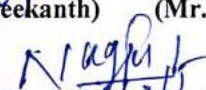
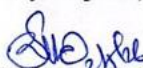
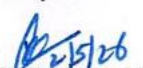
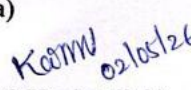
Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector.

Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth.

Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart.

Wave guides: Rectangular and circular wave guides,

Antennas: Antenna Parameters, principles, Dipole and monopole antennas, linear antenna arrays.

 (Dr. N. Sreekanth)  (Mr. Vikas Reddy Rapuru)  (Mr. Syed Javeed Basha)
 (Dr. J. Chinna Babu)  (Dr. CH. Nagaraju)  (Dr. S. Fahimuddin)  (Dr. C. Venkatesh)  (Dr. S. Karimullah)



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

LIST OF EXAMINERS - III B.TECH. I SEMESTER

S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	VLSI Design (24AECE51T)	Dr.P.Anwar Basha	Professor	Department of ECE, BVRITHCEWH, Hyderabad Mobile: 9440215230 Mail ID: anwarbashapattan@gmail.com
2		Dr.K.Murali	Professor & Head	Department of ECE, NEC, Nellore Mobile: 9392901062 Mail ID: murali.nec@gmail.com
3		Dr. S. Nagaraj	Associate Professor	Department of ECE, SVCET, Chittoor Mobile: 9885662876 Mail ID: nagarajusubramanyam@gmail.com
4		Dr.SM.Shamsheer Daula	Associate Professor	Department of ECE,GPREC, Kurnool Mobile: 994921009. Mail ID: shamsheer.ece@gprec.ac.in
5		Dr. J. Amarendra	Professor & Principal	Department of ECE, Audisankara Deemed to be University, Gudur Mobile: 8019681152 Mail ID: amarendra.jadda@gmail.com
1	Microprocessors and Microcontrollers (24AECE52T)	Dr.K.Rajasekhar	Professor	Department of ECE, JNTUK, Kakinada Mobile: 9949842102 Mail ID: rajakarumuri87@jntucek.ac.in
2		Dr. P.Mohanaiah	Professor	Department of ECE, NBKRIST, Vidyanagar, Vakadu. Mobile: 9440282613 Mail ID: mohanaiah613@gmail.com
3		Dr.K.Sudhakar	Professor	Department of ECE, SJCT, Emmiganuru, Kurnool Mobile: 9963623437 Mail ID: komerasudhakar403@gmail.com
4		Dr. Prakash Kodali	Assistant Professor	Department of ECE, NIT, Warangal. Mobile: 8074035659 Mail ID: kprakash@nitw.ac.in
5		Dr. Karuna Kumari	Associate Professor	Department of ECE,Vignan's Institute of Information Technology.Viyaz. Mobile: 9014744333 Mail ID: karuna10040@vignaniit.edu.in
1	Antennas & Wave Propagation (24AECE53T)	Dr.G.Reddy Hemantha	Associate Professor	Department of ECE, MITS, Madanapalli Mobile: 8099675777 Mail ID: hemanthag75@gmail.com
2		Dr.G.Ramesh	Associate Professor	Department of ECE,GPREC, Kurnool Mobile: 9885858410 Mail ID: ramesh.ece@gprec.ac.in
3		Dr.K.Mahesh Babu	Associate Professor	Department of ECE, Aditya University, Kakinada Mail ID: maheshbabu.kota2414@gmail.com Mobile:9848969690
4		Dr.M.Adisheshaiah	Professor	Department of ECE, CREC, Tirupathi Mobile: 9177187801 Mail ID: adishes.mi@gmail.com
5		Dr.M.Kamaraju	Professor	Department of ECE, Gudlavalleru Engineering College, East Godavari. Mobile: 9849157394 Mail ID: profmkr@gmail.com

(Dr.N.Sreekanth)

(Mr. Vikas Reddy Rapuru)

(Mr. Syed Javeed Basha)

(Dr.J.Chinna Babu)

(Dr.CH.Nagaraju)

(Dr. S.Fahimuddin)

(Dr.C.Venkatesh)

(Dr.S.Karimullah)



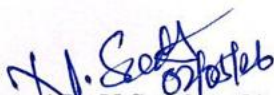
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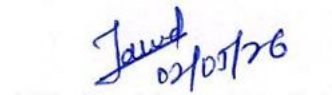
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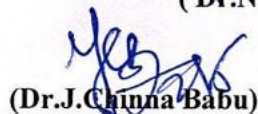
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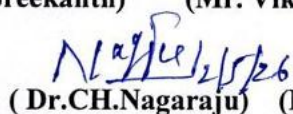
S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	CONTROL SYSTEMS (24AECE5CT)	Dr.G.Reddy Hemantha	Associate Professor	Department of ECE, MITS Deemed to be University, Madanapalli Mobile:8099675777 Mail ID: hemanthag75@gmail.com
2		Dr.P.Sreenivasulu	Professor	Department of ECE, Audisankara Deemed to be University, Gudur Mobile: 9490248696 Mail ID: sreenu306@gmail.com
3		Dr.B.Suresh Babu	Associate Professor	Department of ECE, Viswam Engg. College, Madanapalli Mobile: 9985408112 Mail ID: sureshdecs10@gmail.com
4		Dr. R. Hanuma naik	Associate Professor	Department of ECE, RGM CET, Nandayal Mobile: 988551171 Mail ID: rhnaik.1717@gmail.com
5		Dr. R.Ravindraiah	Associate Professor	Department of ECE, MITS Deemed to be University, Madanapalli Mobile:9492945886 Mail ID: ravindra.ranga@gmail.com

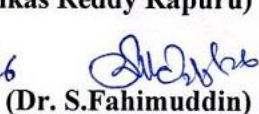

(Dr.N.Sreekanth)

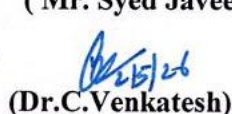

(Mr. Vikas Reddy Rapuru)

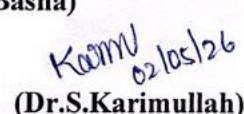

(Mr. Syed Javeed Basha)


(Dr.J.Chinna Babu)


(Dr.CH.Nagaraju)


(Dr. S.Fahimuddin)


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(Dr.S.Karimullah)



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III B.TECH. II SEMESTER

S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	EMBEDDED SYSTEMS (24AECE61T)	Dr. Karuna Kumari	Associate Professor	Department of ECE, Vignan's Institute of Information Technology. Vizag. Mobile: 9014744333 Mail ID: karuna10040@vignaniit.edu.in
2		Dr.B.Saroja	Professor & Head	Department of ECE, SISTK, Puttur. Mobile:8297128999. Mail ID: boda.saroja@gmail.com
3		Dr.K.C.Kullayappa	Professor	Department of ECE, PVKKIT, Ananthapuramu. Mobile:9949259709. Mail ID: kanekal.kullayappa1976@gmail.com
4		Dr.C.Raju	Professor	Department of ECE, SVCE, Tirupathi. Mobile: 8142488696 Mail ID:C.raju1112@gmail.com
5		Dr.r.Kiran Kumar	Associate Professor	Department of ECE, MITS, Madanapalli Mobile: 9642961107 Mail ID: kirankumarr@gmail.com
1	MICROWAVE ENGINEERING (24AECE62T)	Dr.M.Chennakesava	Associate Professor	Department of ECE, RGM CET, Nandyal. Mobile: 7780420770 Mail ID: chennakesava318@gmail.com
2		Dr.M.Adisheshaiah	Associate Professor	Department of ECE, CREC, Tirupathi. Mobile: 9177187801 Mail ID:adisesh.mi@gmail.com
3		Dr.P.Brundhavan	Associate Professor	Department of ECE, RSREC, Kavali Mobile: 8919600026 Mail ID:brundavenky777 @gmail.com
4		Dr.VNV.Satyaprakash	Associate Professor	Department of ECE, RGM CET, Nandyal. Mobile: 9441082559 Mail ID:prakashvnnv@gmail.com
5		Dr.PV. Gopi Krishna Rao	Professor	Department of ECE, RGM CET, Nandyal. Mobile: 9440277731 Mail ID: p.vgopikrishnarao@rgmcet.edu.in
1	DIGITAL SIGNAL PROCESSING (24AECE63T)	Dr. S. Shafiulla Basha	Associate Professor	Department of ECE, YSREC, YV University. YSR Kadapa. Mobile: 9701077718 Mail ID: shafiulla@gmail.com
2		Dr.K.Sravan Kumar	Professor	Department of ECE, GIST, Nellore Mobile: 9704369132 Mail ID: kalikisravanreddy@gmail.com
3		Dr. S.Nagaraja Rao	Professor	Department of ECE, GPREC, Kurnool. Mobile: 9440328621 Mail ID: drsnrao.ece@gprec.in
4		Dr.G.Naga Jyothi	Associate Professor	Department of ECE, MITS, Madanapalli Mobile: 9100973376 Mail ID: drnagajyothig@mits.ac.in
5		Dr. Anoop Kumar Mishra	Professor	Department of ECE, VIT, Amaravathi Mobile: 8839144472 Mail ID: anoop.m@vitap.ac.in

(Dr.N.Sreekanth)

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(Dr.J.Chinna Babu)

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1	RADAR ENGINEERING (24AECE6CT)	Dr.B.P.Santhosh Kumar	Professor	Department of ECE, YVUCE, Prodattur Mobile: 9440018002 Mail ID: santoshyvuce@gmail.com
2		Dr.SM.Shamsheer Daula	Associate Professor	Department of ECE,GPREC, Kurnool Mobile: 994921009. Mail ID: shamsheer.ece@gprec.ac.in
3		Dr.VNV.Satya Prakash	Professor	Department of ECE,RGM CET, Nandyal Mobile: 9441082559 Mail ID: prakashvnn@gmail.com
4		Dr.T.Lakshminarayana	Associate Professor	Department of ECE, KLMCEW, Kadapa. Mobile:9866659594 Mail ID: lakshmi.svuniversity@gmail.com
5		Dr.M.Kamaraju	Professor	Department of ECE, Gudlavalleru Engineering College, East Godavari. Mobile: 9849157394 Mail ID: profmkr@gmail.com

(Signature)
(Dr.N.Sreekanth)

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ANNEXURE -7



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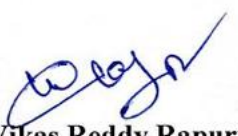
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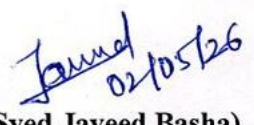
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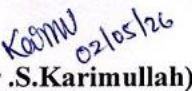
The following recommendations have been forwarded from the feedback committee, Programme Assessment Committee (PAC) and Department Advisory Board (DAB) to the BoS. The approved resolutions are detailed below point-wise:

S.No	Discussion about	Resolution
1	Requested more practical exposure by increasing laboratory sessions and hands-on experience.	It has been resolved to increase laboratory sessions and incorporate more hands-on practical experiments in the upcoming semester.
2	Requested to organize more activities related to games and sports for overall development.	It has been resolved to enhance activities related to games and sports for overall student development.
3	Requested to conduct workshops on Artificial Intelligence tools to enhance knowledge of emerging technologies.	It has been resolved to conduct workshops on Artificial Intelligence tools to improve knowledge of emerging technologies.
4	Requested Campus Recruitment Training (CRT) programs focusing on core domains.	It has been resolved to organize Campus Recruitment Training (CRT) programs with a focus on core subjects.
5	Requested more workshops, internships, and guest lectures from industry experts, especially in core subject areas.	It has been resolved to organize more workshops, internships, and guest lectures by industry experts, particularly in core subject areas, in the upcoming semesters.
6	Need an additional computer laboratory to meet academic requirements.	It has been resolved to provide an additional computer laboratory in the upcoming semester to meet academic requirements.
7	Requested to include Computer Networks course in the curriculum.	It has been resolved to include the Computer Networks course in the curriculum in the upcoming academic year.


(Dr. N. Sreekanth)


(Mr. Vikas Reddy Rapuru)


(Mr. Syed Javeed Basha)

 (Dr. J. Chinna Babu)  (Dr. CH. Nagaraju)  (Dr. S. Fahimuddin)  (Dr. C. Venkatesh)  (Dr. S. Karimullah)



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RAJAMPET, YSR District, AP - 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Glimpses of BoS Meeting Held on 02/05/2026

Venue: ECE Computer Lab (PG Block)

