ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MEETING MINUTES

of

BOARD OF STUDIES

ACADEMIC YEAR: 2024-2025

Date & Time: 09/06/2025 & 10:00AM

Venue: PG Block (Room No.:318)

ANNAMACHARYA UNIVERSITY

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

Ref.No.:/AU/SoE/ECE/BoS-02/2025-26/MoM-01 Date: 09/06/2025

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2nd BoS Minutes of Meeting

The 2nd meeting of the Board of Studies (BoS) for the Department of Electronics and Communication Engineering was held in hybrid mode on 09th June 2025 in Room No. 318 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.CH.Nagaraju	Professor & Head, Dept. of ECE, Annamacharya University, Rajampet Ph:9989994021 Email:chrajuaits@gmail.com	Chairman
2.	Dr.J.Chinna Babu	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:886404835 Email:jchinnababu@gmail.com	Senior Faculty-Member
3.	Dr.C.Venkatesh	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9985032919 Email:venky.cc@gmail.com	Senior Faculty-Member
4.	Dr.K.Riyazuddin	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9885648459 Email:riyazoo2002@yahoo.co.in	Course Coordinator-Member
5.	Dr.S.Karimullah	Assistant Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:8978078010 Email:munnu483@gmail.com	Course Coordinator-Member
6.	Dr.N.N.Murthy	Professor, IIT Tirupathi. Ph:9439429709 Email:nnmurty@iittp.ac.in	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 & Head, Dept. of ECE Mallareddy University, Hyderabad, Telangana. Ph:9603709796 Email:nsreeku@gmail.com	University Nominee-Member

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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:sydjaveev221@gmail.com	Alumni Representative-Member

Members of Absence: NIL

Agenda of the Meeting:

Item No	Particulars
BoS/2025/ECE/2.1	Confirmation of the Minutes of the 1st Board of Studies Meeting.
BoS/2025/ECE/2.2	To discuss and finalize the course structure and syllabus for II-B.Tech., under the AU-24 Regulations.
BoS/2025/ECE/2.3	To discuss and finalize the course structure and syllabus for II-M.Tech.(Embedded Systems) under the AU-24 Regulations.
BoS/2025/ECE/2.4	To review and address any discrepancies observed in the first-year UG and PG courses (i.e., B.Tech. and M.Tech.(Embedded Systems)) under the AU-24 Regulations.
BoS/2025/ECE/2.5	To discuss and approve the Programme Educational Objectives (PEOs), Programme Specific Outcomes (PSOs), and Course Outcomes (COs) of the respective departments.
BoS/2025/ECE/2.6	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 respective departments.
BoS/2025/ECE/2.7	To discuss and approve the syllabus for the Annamacharya University Research Admission Test (AURAT) - 2025 for the ECE department.
BoS/2025/ECE/2.8	To approve the list of examiners for second-year courses/subjects.
BoS/2025/ECE/2.9	To discuss the introduction of new programmes and/or proposals for increase in intake, if applicable.
BoS/2025/ECE/2.10	Discussion on feedback received regarding the curriculum
BoS/2025/ECE/2.11	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

Welcome and Introduction

Welcome:

Dr CH.Nagaraju, Chairman, Board of Studies has extended warm welcome to all the members.

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Introduction:

At the outset, Dr CH.Nagaraju, Chairman, Board of Studies, introduced all the members of the Board of Studies and thanked them for accepting the invitation to the 2nd BoS meeting. The agenda for the ECE -BoS meeting was then read and the forum was open for individual subject deliberations.

Agenda Item No. BoS/2025/ECE/2.1.: Confirmation of the Minutes of the 1st Board of Studies Meeting.

The chairman has presented the minutes of 1st Board of studies meeting of the department of ECE, Annamacharya University, Rajampet held on 27th August 2024 to be ratified. After deliberations and discussions the 1st BoS meeting minutes were ratified.

Agenda Item No. BoS/2025/ECE/2.2.: To discuss and finalize the course structure and syllabus for II-B.Tech., under the AU-24 Regulations.

Dr.CH.Nagaraju presented the II-B.Tech course structure and detailed syllabi of ECE department to the members. The following discussions are made.

Dr.N.Balaji, Subject expert, suggested to change the title "Digital Logic Design" to "Switching Theory and Logic Design" for the theory and Lab courses in II-B.Tech I semester. He also suggested to add two more additional experiments beyond the syllabus in "Switching Theory and Logic Design lab" course.

Dr. N. N. Murthy, subject expert, recommended including additional VHDL-related reference textbooks in the Switching Theory and Logic Design course.

Resolution:

After the deliberations the members of BoS accepted to change the title Digital Logic Design to Switching theory and Logic Design for the theory and Lab courses in II-B.Tech I semester. Also, the members of BoS accepted to include two more additional experiments beyond the syllabus in "Switching Theory and Logic Design lab" course.

Also, the members of BoS accepted to include additional VHDL-related reference textbooks in the Switching Theory and Logic Design course. The members unanimously approved the II-B.Tech Course Structure & Syllabi under AU24 regulations for the ECE Department.

The II-B.Tech course structure and detailed syllabi of Electronics and Communication Engineering Department is shown in Annexure-I.

Agenda Item No. BoS/2025/ECE/2.3.: To discuss and finalize the course structure and syllabus for II-M.Tech.(Embedded Systems) under the AU-24 Regulations.

II-M.Tech Course Structure and detailed Syllabi of Embedded Systems has been presented by Dr. CH.Nagaraju for discussion among the members of the Board of Studies of Electronics and Communication Engineering.

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them to be well-aligned with the institutional vision, mission, and graduate attributes.Further, the Chairman proposed to discuss the Course Outcomes (COs) for the II B.Tech. ECE courses under the R-24 Regulation.

The course-wise COs were presented in detail, ensuring alignment with the relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs). The members reviewed the COs with regard to clarity, measurability, and relevance to the respective course objectives and agreed that they were well-structured and outcome oriented.

Resolution:

The Board reaffirmed and approved the Programme Educational Objectives (PEOs), Programme Outcomes (POs), and Programme Specific Outcomes (PSOs) of the B.Tech. ECE program, as previously approved in the 1st BoS meeting.

The Board reviewed and approved the Course Outcomes (COs) of the II B.Tech. ECE courses under the R-24 Regulation, as presented by the Chairman. It was resolved that these outcomes will be adopted for academic implementation from the current academic year onwards.

The PEOs, POs and PSOs are stated in the Annexure-III.

Agenda Item No. BoS/2025/ECE/2.6.: 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 respective departments.

The Chairman initiated the discussion by highlighting the growing importance of integrating global and national educational priorities into the engineering curriculum. These include the Sustainable Development Goals (SDGs), various cross-cutting issues such as ethics, gender, environment, and human values, as well as the promotion of the Indian Knowledge System (IKS).

Resolution:

The Board resolved to initiate steps toward the integration of SDG-aligned content, cross-cutting themes, and IKS elements into the ECE curriculum in a phased and structured manner. It was agreed that existing subjects (such as Environmental Science, Universal Human Values-II) can be strengthened to reflect these areas and a detailed list of relevant courses is presented in Annexure-IV.

Agenda Item No. BoS/2025/ECE/2.7.: To discuss and approve the syllabus for the Annamacharya University Research Admission Test (AURAT) - 2025 for the ECE department.

Dr.CH.Nagaraju, BoS chairman, presented the syllabus of Electronics and Communication Engineering. for Research admission test i.e., AURAT-2025.

Dr.N.Balaji, Subject expert, suggested to change the title "Communications" in unit-IV as "Analog and Digital Communications" in the Research Admission Test-2025 (AURAT) syllabus for the Electronics and Communication Engineering.

them to be well-aligned with the institutional vision, mission, and graduate attributes.Further, the Chairman proposed to discuss the Course Outcomes (COs) for the II B.Tech. ECE courses under the R-24 Regulation.

The course-wise COs were presented in detail, ensuring alignment with the relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs). The members reviewed the COs with regard to clarity, measurability, and relevance to the respective course objectives and agreed that they were well-structured and outcome oriented.

Resolution:

The Board reaffirmed and approved the Programme Educational Objectives (PEOs), Programme Outcomes (POs), and Programme Specific Outcomes (PSOs) of the B.Tech. ECE program, as previously approved in the 1st BoS meeting.

The Board reviewed and approved the Course Outcomes (COs) of the II B.Tech. ECE courses under the R-24 Regulation, as presented by the Chairman. It was resolved that these outcomes will be adopted for academic implementation from the current academic year onwards.

The PEOs, POs and PSOs are stated in the Annexure-III.

Agenda Item No. BoS/2025/ECE/2.6.: 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 respective departments.

The Chairman initiated the discussion by highlighting the growing importance of integrating global and national educational priorities into the engineering curriculum. These include the Sustainable Development Goals (SDGs), various cross-cutting issues such as ethics, gender, environment, and human values, as well as the promotion of the Indian Knowledge System (IKS).

Resolution:

The Board resolved to initiate steps toward the integration of SDG-aligned content, cross-cutting themes, and IKS elements into the ECE curriculum in a phased and structured manner. It was agreed that existing subjects (such as Environmental Science, Universal Human Values-II) can be strengthened to reflect these areas and a detailed list of relevant courses is presented in Annexure-IV.

Agenda Item No. BoS/2025/ECE/2.7.: To discuss and approve the syllabus for the Annamacharya University Research Admission Test (AURAT) - 2025 for the ECE department.

Dr.CH.Nagaraju, BoS chairman, presented the syllabus of Electronics and Communication Engineering. for Research admission test i.e., AURAT-2025.

Dr.N.Balaji, Subject expert, suggested to change the title "Communications" in unit-IV as "Analog and Digital Communications" in the Research Admission Test-2025 (AURAT) syllabus for the Electronics and Communication Engineering.

Resolution:

The Board considered the suggestion made by Dr. N. Balaji, Subject Expert, to revise the title "Communications" in Unit-IV of the Research Admission Test-2025 (AURAT) syllabus for Electronics and Communication Engineering. After discussion, the Board unanimously approved the change of the unit title to "Analog and Digital Communications" to better reflect the content and scope of the subject. Members unanimously approved the syllabus of Electronics and Communication engineering for Research admission test. Research Admission Test-2025 (AURAT) syllabus for the Electronics and Communication Engineering are provided in Annexure-V.

Agenda Item No. BoS/2025/ECE/2.8.: To approve the list of examiners for second-year courses/subjects.

The Chairman presented the proposed panel of examiners for the second-year (III and IV semesters) B.Tech. ECE courses for the current academic year. The Board carefully reviewed the qualifications and institutional affiliations of the proposed examiners. The members found the list to be appropriate and in line with university norms and examination regulations.

Resolution:

After deliberations, the Board approved the proposed list of examiners for the second-year B.Tech. ECE courses. The finalized list of examiners are provided in Annexure-VI.

Agenda Item No. BoS/2025/ECE/2.9.: To discuss the introduction of new programmes and/or proposals for increase in intake, if applicable.

The Chairman informed the Board that the B.Tech. ECE intake has been increased from 240 to 360 for the academic year 2025–2026, with due approval from the university and statutory bodies. **Resolution:** After deliberations, the Board of Studies noted and endorsed the increase in intake for the B.Tech. ECE program from 240 to 360 from the academic year 2025–2026. This increase reflects the rising demand for the program and the department's readiness in terms of infrastructure, faculty, and academic planning. The Board noted and appreciated the department's efforts in this regard. The Board also recommended that necessary planning and resource augmentation (such as lab expansion and faculty recruitment) continue to support the enhanced intake effectively.

Agenda Item No. BoS/2025/ECE/2.10.: Discussion on feedback received regarding the curriculum

The chairman informed the BOS members that feedback collection process for the current academic year is yet to be carried out. Hence there are no feedback points to be addressed at present.

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Agenda Item No. BoS/2025/ECE/2.11.: Any other item with the permission of the Chair.

With the permission of the Chair, the formation of the Research Review Committee (RRC) for the Department of Electronics and Communication Engineering was discussed. The Chairman informed the Board that the RRC was constituted in accordance with the recommendations made in the R&D Cell meeting held on 29-04-2025. The committee is established to review and monitor the progress of research scholars, ensure the quality of research outcomes, and assist in effective research planning within the department.

Resolution:

The Board noted and approved the formation of the Research Review Committee (RRC) for the Department of ECE, in reference to the R&D Cell meeting minutes dated 29-04-2025.

The list of the Research Review Committee (RRC) members is provided in Annexure-VII.

Dr. CH. Nagaraju, Chairman of the BoS, proposed the Vote of Thanks. He expressed his sincere gratitude to all BoS members for their dedicated participation, valuable inputs to the course, and meaningful contributions to the syllabus discussions. He acknowledged that these changes will significantly enrich the curriculum and help align it with global academic standards.

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Rajampet, Annamayya District, A.P – 516126, INDIA

Attendance sheet :

BoS Members:

Sl.No	Name	Affiliation	Role in BoS	Signature with Date
1.	Dr.CH.Nagaraju	Professor & Head, Dept. of ECE, Annamacharya University, Rajampet Ph:9989994021 Email:chrajuaits@gmail.com	Chairman	
2.	Dr.J.Chinna Babu	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:886404835 Email:jchinnababu@gmail.com	Senior Faculty-Member	
3.	Dr.C.Venkatesh	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9985032919 Email:venky.cc@gmail.com	Senior Faculty-Member	
4.	Dr.K.Riyazuddin	Associate Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:9885648459 Email:riyazoo2002@yahoo.co.in	Course Coordinator-Member	
5.	Dr.S.Karimullah	Assistant Professor, Dept. of ECE, Annamacharya University, Rajampet Ph:8978078010 Email:munnu483@gmail.com	Course Coordinator-Member	
6.	Dr.N.N.Murthy	Professor, IIT Tirupathi. Ph:9439429709 Email:nnmurty@iittp.ac.in	Subject Expert-Member	Attended Online
7.	Dr.N.Balaji	Professor, Department of ECE JNTUK, Kakinada. Ph:9502441555 Email:prof.balaji.ece@gmail.com	Subject Expert-Member	Attended Online
8.	Dr.N.Sreekanth	Professor & Head, Dept. of ECE Mallareddy University, Hyderabad, Telangana. Ph:9603709796 Email:nsreeku@gmail.com	University Nominee-Member	Attended Online
9.	Mr. Vikas Reddy Rapuru	Director, Technotron, Hyderabad, Telangana. Ph:9703047292 Email:vikas@technotran.in	Industry Representative -Member	Attended Online
10.	Mr. Syed Javeed Basha	Design Verification Engineer, SmartSOC Pvt.Ltd., Bangalore, Karnataka Ph:8328623437 Email:sydjaveev221@gmail.com	Alumni Representative -Member	Attended Online

ANNAMACHARYA UNIVERSITY

Estd. under Andhra Pradesh Private Universities (Establishment and Regulation) Act, 2016

ANNEXURE-I

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

BASIC STRUCTURE FOR ELECTRONICS & COMMUNICATION ENGINEERING (R24 regulations)

Semester III (Second year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	BSC	24AMAT32T	Probability and Random Process	3	0	0	3
2	PCC	24AECE31T	Signals and Systems	3	0	0	3
3	PCC	24AECE32T	Switching Theory & Logic Design	3	0	0	3
4	HSMC	24AUHV31T	Universal Human Values-II	3	0	0	3
5	PCC	24AECE33T	Analog Circuits	3	0	0	3
Lab Courses							
6	PCC	24AECE31L	Signals and Systems lab	0	0	3	1.5
7	PCC	24AECE32L	Switching Theory & Logic Design Lab	0	0	3	1.5
8	PCC	24AECE33L	Analog Circuits lab	0	0	3	1.5
9	SC	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	2
Total Credits	**21.5**

Semester IV (Second year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	ESC	24AECE41T	Linear IC applications	3	0	0	3
2	HSMC	24AMBA41T	Managerial Economics & Financial Analysis	3	0	0	3
3	PCC	24AECE42T	Analog and Digital Communications	3	0	0	3
4	PCC	24AECE43T	Electromagnetic waves and transmission lines	3	0	0	3
5	PCC	24AECE44T	Digital System Design Using VHDL	3	0	0	3
6	MC	24AENS41T	Environmental Science	2	0	0	0
Lab Courses							
7	ESC	24AECE41L	Linear IC applications lab	0	0	3	1.5
8	PCC	24AECE42L	Analog and Digital Communications lab	0	0	3	1.5
9	PCC	24AECE43L	Digital System Design Using VHDL	0	0	3	1.5
10	SC	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**

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
RAJAMPET, Annamayya District, AP-516126, INDIA

Department of Humanities & Sciences

Date: 28-06-2025

To
The Head of the Department
Electronics and Communication Engineering (ECE)
Annamacharya University
Rajampet

Dear Sir/Madam,

Subject: Submission of H&S Courses Offered to **ECE** Department for 2nd Year (III & IV Semesters) - Reg.

I am writing to bring to your kind attention that the Department of Humanities and Sciences (H&S) will be offering the following courses to the **ECE** department in the 2nd year, for both the III and IV semesters. These courses have been discussed and approved in the 2nd Board of Studies (BOS) meeting.
The list of approved courses is as follows:

B.Tech. III Semester

Sl. No.	Category	Course Code	Course Title	Hours per Week			Credits
				L	T	P	C
1	BS	24AMAT32T	Probability and Random Process	3	0	0	3
2	HSM	24AUHV31T	Universal Human Values-II	3	0	0	3

B.Tech. IV Semester

Sl. No.	Category	Course Code	Course Title	Hours per Week			Credits
				L	T	P	C
1	MC	24AENS41T	Environmental Science	2	0	0	0

We request you to kindly consider these courses in the curriculum structure of the **ECE** department for the academic year 2025-2026.
Thank you for your attention and cooperation. Please feel free to contact me for any further clarifications.

With Regards,

Dr. L. Obulapathi
Head of the Humanities and Science
Annamacharya University
Rajampet

Enclosure:

1. Syllabus copy Probability and Random Process
2. Syllabus copy of Environmental Science
3. Syllabus copy of Universal Human Values-II (UHV-II)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course:	Probability and Random Process
Category:	BS&H
Couse Code:	24BMAT32T
Branch/es:	ECE
Semester:	III Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

The objective of this course is to provide students with a solid foundation in the principles of probability theory and random processes, enabling them to model, analyze, and interpret random phenomena. The course aims to equip students with the analytical tools necessary to apply probabilistic and statistical methods to real-world engineering problems, particularly in the areas of communication systems, signal processing, control systems, and noise analysis.

Course Outcomes:

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

1. Understand the concepts of probability.
2. understand the foundational and advanced concepts of random variables and their distributions.
3. apply the concepts of multiple random variables, including joint and conditional distributions, statistical independence in signal processing, communication systems
4. analyze temporal characteristics of random processes such as autocorrelation and cross correlation.
5. Apply power spectral density to describe random processes.

Unit 1 Probability 10

Probability - axioms of probability – addition theorem of probability - conditional probability-multiplication theorem of probability (without proof) - Baye's theorem.

Unit 2 Random Variable 8

The Random Variable Concept, Discrete and continuous Distribution functions, Mean and Variance, Operations on One Random Variable, Expected Value of a Random Variable, Expected Value of a Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, J Chebyshev's Inequality, Markov's Inequality, Characteristic Function, Moment Generating Function, Chernoff's Inequality and Bound, Transformations of a Random Variables, Monotonic Transformation of a Continuous Random Variable.

Unit 3 Multiple Random Variables 12

Vector Random Variables, Joint Distribution and Its Properties, Joint Density and Its Properties, Conditional Distribution and Density, Statistical Independence, Distribution and Density of a Sum of Random Variables, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, Operations on Multiple Random Variables: Expected Value of a Function of Random Variables, Joint Characteristic Functions, Jointly Gaussian Random Variables.

Unit 4 Random Processes - Temporal Characteristics: 8

The Random Process Concept, Classification of Processes, Deterministic and Non deterministic Processes, Stationarity and Independence, Distribution and Density Functions, Statistical Independence, First-Order

Stationary Processes, II-Second-Order and Wide Sense Stationarity, N^{th}-Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Correlation Functions, Autocorrelation Function and Its Properties, cross-Correlation Function and Its Properties, measurement of correlation functions, Gaussian random processes, Poisson random process.

Unit 5 Random Processes - Spectral Characteristics: 10

Power Density Spectrum and Its Properties, Bandwidth of the Power Density Spectrum, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum and Its Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Prescribed Textbooks:

1. Peyton Z. Peebles, "Probability, Random Variables & Random Signal Principles", 4th Edition, TMH, 2002.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2017, 44th Edition

Reference Books:

1. Athanasios Papoulis and S. Unnikrishna Pillai, "Probability, Random Variables and Stochastic Processes", 4th Edition, PHI, 2002
2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley India
3. Henry Stark and John W. Woods, "Probability and Random Processes with Application to Signal Processing," 3rd Edition, Pearson Education, 2002.
4. B. V. Ramana, Higher Engineering Mathematics, Mc.Graw Hill 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 society	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	Engineering Knowledge
24AMAT32T.1	2	2	1	1	-	-	-	-	-	-	1	-
24AMAT32T.2	3	2	1	2	-	-	-	-	-	-	1	-
24AMAT32T.3	3	3	2	2	-	-	-	-	-	-	1	-
24AMAT32T.4	3	2	1	2	-	-	-	-	-	-	1	-
24AMAT32T.5	3	2	1	2	-	-	-	-	-	-	1	-

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Title of the Course: Signals and Systems
Category: PCC
Semester: III Semester
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 the 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, Distortionless 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 SamplingTechniques,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.

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 and Z–Transforms **12**

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

Z-Transforms-Relation between DTFT and Z-Transform, Region of Convergence, Z- transforms of common sequences, Properties, Inverse Z-Transform.

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	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Switching Theory & Logic Design
Category: PCC
Semester: III Semester
Couse Code: 24AECE32T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To get the knowledge on Number Systems and codes.
2. To gain the knowledge on Boolean algebra.
3. To acquire the knowledge of various circuits in Digital design

Course Outcomes:

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

1. Understand different number systems conversions & Binary codes
2. Simplify Boolean functions& realize them using digital logic gates.
3. Design various combinational circuits and Programmable Logic Devices
4. Design various sequential circuits.
5. Understand the Minimization techniques of Finite State Machine and the elements of ASM chart.

Unit 1 Number systems, Codes & Boolean Algebra **12**

Philosophy of number systems – r, (r-1)"s complement, representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

Boolean algebra: Fundamental postulates of Boolean algebra, Basic theorems and properties, digital logic gates, properties of XOR gate, universal gates.

Unit 2 Switching Functions and their Minimization **12**

Switching Functions-Canonical and Standard forms, algebraic simplification using Boolean theorems, two level & Multilevel Realization of Boolean Functions using Universal Gates.

Minimization: K-Map methods, Prime Implicants, don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicants chart, simplification rules.

Unit 3 Combinational Logic Design & Programmable Logic Devices **12**

Design using conventional logic gates-Binary Adders, Subtractors, Ripple Adder, Magnitude comparator, Encoder, Decoder, Multiplexer, De-Multiplexer, Code converters

Unit 4 Sequential Circuits **12**

Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops, Triggering and excitation tables, flip flop conversions, Steps in synchronous sequential circuit design, Design of modulo-N Synchronous counters – up/down counter

Unit 5 FSM Minimization **12**

Finite state machine- capabilities and limitations, Mealy and Moore models and their conversions, Serial binary adder. Minimization of completely specified sequential machines-Partition techniques. . Salient features of the ASM chart, Simple examples.

Prescribed Textbooks:

1. Morris Mano, Digital Design. Prentice Hall India, 3rdEd
2. ZVI Kohavi and Niraj K. Jha Switching & Finite Automata theory. Tata McGraw Hill, 3 rdEd

Reference Books:

1. Charles H. Roth, Fundamentals of Logic Design. Thomson Publications, 2004, 5thEd
2. Fletcher, an Engineering Approach to Digital Design. Prentice Hall India. Anand Kumar, Switching Theory and Logic Design. Prentice Hall India, 2008

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
24AECE32T.1	2	-	2	-	2	-	1	-	-	2	-	3	-
24AECE32T.2	2	2	2	-	-	1	1	-	-	2	-	2	-
24AECE32T.3	2	2	2	-	-	1	1	-	-	2	-	-	-
24AECE32T.4	2	2	2	-	-	1	1	-	-	2	-	-	-
24AECE32T.5	2	2	2	-	-	1	1	-	-	2	-	-	-

II B.Tech

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Universal Human Values – II
Category: Humanities
Course Code: 24AUHV31T/24AUHV41T
Branches:
Semester: I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives: The course aims to help students recognize the vital interplay between values and skills, promoting sustained happiness and prosperity. It seeks to foster a holistic perspective on life and profession, encouraging value-based living through a clear understanding of human reality and existence. Additionally, the course emphasizes the ethical implications of such an understanding, fostering trustful behaviour, fulfilling human interactions, and a harmonious relationship with nature.

Course Outcomes:

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

1. comprehend the terms like Natural Acceptance, Happiness and Prosperity
2. analyze one's self, and one's surroundings (family, society, nature)
3. apply human values in enriching human relationships and human society.
4. analyze the need for universal human values and harmonious existence.
5. evaluate themselves as socially and ecologically responsible engineers.

Unit 1 Introduction to Value Education 12

Lecture1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)
Lecture2: Understanding Value Education
Tutorial 1: Practice Session1: Sharing about oneself
Lecture 3: Self-Exploration as the Process for Value Education
Lecture4: Continuous Happiness and Prosperity – The Basic Human Aspirations
Tutorial 2: Practice Session2: Exploring Human Consciousness
Lecture 5: Happiness and Prosperity – Current Scenario
Lecture 6: Method to Fulfill the Basic Human Aspirations
Tutorial 3: Practice Session3: Exploring Natural Acceptance

Unit 2 Harmony in the Human Being 8

Lecture 7: Understanding Human being as the co-existence of the self and the body.
Lecture 8: Distinguishing between the needs of the self and the body
Tutorial 4: Practice Session4: Exploring the difference of needs of self and body.
Lecture 9: The body as an instrument of the self
Lecture 10: Understanding harmony in the self
Tutorial 5: Practice Session5: Exploring sources of imagination in the self
Lecture 11: Harmony of the self with the body
Lecture 12: Programme to ensure self-regulation and health
Tutorial 6: Practice Session 6: Exploring harmony of self with the body

Unit 3 Harmony in the Family and Society 8

Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction
Lecture 14: 'Trust' – the Foundational Value in Relationship
Tutorial 7: Practice Session7: Exploring the Feeling of Trust
Lecture 15: 'Respect' – as the Right Evaluation
Tutorial 8: Practice Session 8: Exploring the Feeling of Respect
Lecture 16: Other Feelings, Justice in Human-to-Human Relationship
Lecture 17: Understanding Harmony in the Society
Lecture 18: Vision for the Universal Human Order
Tutorial 9: Practice Session9: Exploring systems to fulfil human goal

Unit 4 Harmony in the Nature/Existence 10

Lecture 19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, Self-Regulation and Mutual Fulfilment among the Four Orders of Nature
Tutorial 10: Practice Session 10: Exploring the Four Orders of Nature
Lecture 21: Realizing Existence as Co-existence at All Levels
Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session11: Exploring Co-existence in Existence

Unit 5 Implications of the Holistic Understanding – A Look at Professional Ethics 10

Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session 12: Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session13: Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession
Tutorial 14: Practice Session14: Exploring Steps of Transition towards Universal Human Order

Practice Sessions for UNIT I – Introduction to Value Education
PS1 Sharing about Oneself
PS2 Exploring Human Consciousness
PS3 Exploring Natural Acceptance
Practice Sessions for UNIT II – Harmony in the Human Being
PS4 Exploring the Difference of Needs of Self and Body
PS5 Exploring Sources of Imagination in the Self
PS6 Exploring Harmony of Self with the Body
Practice Sessions for UNIT III – Harmony in the Family and Society
PS7 Exploring the Feeling of Trust
PS8 Exploring the Feeling of Respect
PS9 Exploring Systems to fulfil Human Goal
Practice Sessions for UNIT IV – Harmony in the Nature (Existence)
PS10 Exploring the Four Orders of Nature
PS11 Exploring Co-existence in Existence
Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at Professional Ethics
PS12 Exploring Ethical Human Conduct
PS13 Exploring Humanistic Models in Education
PS14 Exploring Steps of Transition towards Universal Human Order

Prescribed Textbooks:

1. The Textbook - R R Gaur, R Asthana, G P Bagaria. *A Foundation Course in Human Values and Professional Ethics.* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.
2. The Teacher's Manual - R R Gaur, R Asthana, G P Bagaria. *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics.* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

1. A. Nagaraj. *Jeevan Vidya: Ek Parichaya.* Jeevan Vidya Prakashan, Amarkantak, 1999.
2. A.N. Tripathi. *Human Values.* New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi. *The Story of My Experiments with Truth*
5. E. F Schumacher. *Small is Beautiful*

Web Resources:

1. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%201Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3S2%20Respect%20July%2023.pdf
4. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%205-Harmony%20in%20the%20Nature%20and%20Existence.pdf
5. https://fdp-si.aicte-india.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%202325%20Ethics%20v1.pdf
6. https://www.studocu.com/in/document/kiet-group-of-institutions/universal-humanvalues/chapter-5-holistic-understanding-of-harmony-on-professional-ethics/62490385https://onlinecourses.swayam2.ac.in/aic22_ge23/preview
7. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20Family.pdf

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 teamwork	Communication	Project management and finance	Life-long learning
24AUHV31T/41T.1			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.2			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.3			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.4			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.5			-	-	-	2	3	-	1	-	2

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Analog Circuits
Category: PCC
Semester: III Semester
Couse Code: 24AECE33T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To analyze small signal models and frequency responses, and to design different amplifier types.
2. To analyze feedback amplifiers, oscillators, large signal amplifiers, and wave shaping circuits, and design practical electronic systems.

Course Outcomes:

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

1. Analyze the single stage amplifiers using h-parameter model at low frequencies.
2. Understand and analyze the feedback amplifiers.
3. Understand the working principle and operation of oscillators
4. Analyze the concepts of large signal amplifiers
5. Design and analyze linear and non-linear wave shaping circuits

Unit 1 Small Signal Analysis of Amplifiers **12**

Introduction to h-parameter model, Small Signal model of BJT, Analysis of CB, CE and CC configurations using h-parameters– simplified hybrid model – miller's theorem – dual of miller's theorem. Analysis of Cascaded Transistor Amplifiers- RC Coupled amplifier, Frequency response of RC Coupled, Direct-coupled and Transformer coupled amplifiers.

Unit 2 Feedback Amplifiers **12**

Concept of Feedback, Classification of feedback amplifiers, Transfer Gain with feedback, General characteristics of negative feedback amplifiers. Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components (Topologies)

Unit 3 Oscillators **11**

Condition for oscillations, Oscillator Types, Frequency and amplitude stability of oscillators, LC oscillators- Hartley and Colpitts oscillators, RC-phase shift and Wien bridge oscillators, Crystal Oscillators.

Unit 4 Large Signal Amplifiers **10**

Classifications, Class A power Amplifiers- Direct coupled and Transformer Coupled, Class B power Amplifiers- Push-pull and Complementary Symmetry-Transistor power dissipation, Power and Efficiency calculations

Unit 5 Linear Wave Shaping & Non-Linear Wave Shaping **12**

Linear Wave Shaping: High pass & low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and Exponential inputs.

Non-Linear Wave Shaping: Diode and Transistor clippers and clampers, clamping circuit theorem.

Prescribed Textbooks:

1. J. Millman and Christos C. Halkias- "Integrated Electronics", Mc Graw-Hill, 1972.
2. Robert T. Paynter- "Introductory Electronic Devices and Circuits", Pearson Education, 7th Edition

Reference Books:

1. Robert L. Boylestad and Louis Nashelsky - "Electronic Devices and Circuits Theory", Pearson/Prentice Hall, 9th Edition, 2006
2. Donald A. Neumann- "Electronic Circuit Analysis and Design", Mc Graw Hill

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
24AECE33T.1	3	3	3	3	3	1	-	2	-	-	-	2	-
24AECE33T.2	3	2	3	2	2	-	-	2	-	-	-	3	-
24AECE33T.3	3	2	3	2	2	1	-	2	-	-	-	2	-
24AECE33T.4	3	3	3	2	2	1	-	2	-	-	-	2	-
24AECE33T.5	3	2	3	-	-	-	-	2	-	-	-	2	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Signals and Systems Lab
Category: PCC
Semester: III Semester
Couse Code: 24AECE31L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To analyse the characteristics of various signals and systems using simulation software
2. To enable the students to know about different transforms with respective waveform generations.
3. To acquire the knowledge of systems and sampling through simulations.
4. To study the convolution and correlation concepts with the help of experimentation

Course Outcomes:

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

1. Understand fundamentals of Signals and systems and operations through simulation.
2. Understand the transforms on various signals practically.
3. Acquire knowledge on the Systems and sampling concepts.
4. Apply the knowledge of Convolution and Correlation theories with the help of Laboratory simulations.

LIST OF EXPERIMENTS: (Execute any 10 experiments)

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit impulse, unit step, square, sawtooth, triangular, sinusoidal, ramp, sinc.
3. Observations on signals and sequences such as addition, multiplication, scaling, shifting, folding, computation of energy and average power.
4. Finding the even and odd parts of signal/sequence and real and imaginary parts of signal.
5. Gibbs phenomenon.
6. Finding the Fourier transform Phase spectrum.
7. Sampling theorem verification.
8. Verification of linearity and time invariance properties of a discrete system.
9. Computation of unit sample, unit step and sinusoidal responses of the given LTI system and verifying its physical reliability and stability properties.
10. Convolution between signals and sequences.
11. Autocorrelation and cross correlation between signals and sequences.
12. Verification of Wiener-khinchine relations
13. Waveform synthesis using Laplace Transform
14. Locating the zeros and poles and plotting the pole Z-plane for the given transfer function

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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
24AECE31L.1	3	1	-	2	-	-	-	-	-	-	3	3	-
24AECE31L.2	2	-	3	-	1	-	-	-	-	-	2	3	-
24AECE31L.3	1	2	-	3	-	3	-	-	-	-	2	2	-
24AECE31L.4	2	3	1	-	1	-	-	2	-	2	1	1	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Switching Theory & Logic Design Lab
Category: PCC
Semester: III Semester
Couse Code: 24AECE32L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To Design different types of Combinational Logic Circuits.
2. To learn about Flip-Flops and their Conversions.
3. To Design Mod-N Synchronous and Shift Register Counters

Course Outcomes:

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

1. Design different types of Combinational Logic Circuits
2. Learn about Various Flip- Flops and their Conversions
3. Design various Mod-N Synchronous and Shift Register Counters.

LIST OF EXPERIMENTS: (Execute any 10 experiments)

1. Logic Gates
2. Realization of AND, OR,NOT,EX-OR,EXNOR functions using universal Gates
3. Applications of logic gates –ADDER,SUBTRACTORS
4. 2-bit Magnitude comparator
5. Decoders
6. Multiplexes
7. Boolean function realization using Decoder and Mux
8. Code converters (Binary to Gray & Gray to Binary)
9. Flip-Flops
10. Flip –Flop Conversions
11. Design of MOD-N synchronous counter
12. Shift register counters (Ring & Twisted Ring Counters)

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
24AECE32L.1	2	2	2	-	-	1	1	-	-	2	-	-	-
24AECE32L.2	2	2	2	-	-	1	1	-	-	2	-	-	-
24AECE32L.3	2	2	2	-	-	1	1	-	-	2	-	-	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Analog Circuits Lab
Category: PCC
Semester: III Semester
Couse Code: 24AECE33L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To study the characteristics and applications of semiconductor devices in amplifier and oscillator circuits.
2. To design and analyze amplifier, oscillator, and wave shaping circuits through hands-on experiments.

Course Outcomes:

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

1. Understand the characteristics of FET and UJT
2. Analyze and design single and multistage amplifiers and feedback amplifiers.
3. Design different oscillators with different frequencies.
4. Determine the efficiencies of power amplifiers
5. Design wave shaping circuits

LIST OF EXPERIMENTS: (Execute any 10 experiments)

1. UJT Characteristics
2. FET characteristics- Drain and Transfer
3. Common Emitter Amplifier
4. Common Source Amplifier
5. Two stage RC-Coupled amplifier
6. Feedback amplifiers - Current / Voltage Series
7. RC Phase shift oscillator
8. Hartley / Colpitt's oscillator
9. Class A / Class B power amplifier
10. Linear wave shaping- RC High Pass and Low Pass circuits
11. Non-linear wave shaping –Clippers
12. Non-linear wave shaping- Clampers

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
24AECE33L.1	2	3	2	2	2	-	-	-	-	-	-	2	-
24AECE33L.2	2	3	2	2	3	-	-	2	-	-	-	2	-
24AECE33L.3	2	3	2	-	3	-	-	2	-	-	-	2	-
24AECE33L.4	2	3	1	-	3	-	-	-	-	-	-	2	-
24AECE33L.5	2	3	3	2	3	-	-	2	-	-	-	2	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: HDL Programming (Verilog)
Category: SC
Semester: III Semester
Couse Code: 24AECE34L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To understand the basics of Verilog
2. To make the students renown to basics, syntax and semantics of new programming language

Course Outcomes:

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

1. Understand, design, simulate and synthesize computer hardware using Verilog HDL
2. Be able to rapidly design combinational and sequential logic
3. Be able to use different Verilog programming constructs in digital system design
4. Gain knowledge in implementing state machines

LIST OF EXPERIMENTS: (Execute any 10 experiments)

1. HDL based Design Flow
2. Language constructs of Verilog HDL
3. Gate Level Modeling
4. Switch Level Modeling
5. Data Flow Modeling
6. Behavioral Modeling
7. User Defined Primitives
8. Functions & Tasks
9. Realization of FSM.
10. SM Charts
11. Design of Multiplier
12. Realization of Dice Game

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
24AECE34L.1	3	3	3	3	3	-	-	3	3	3	1	2	2
24AECE34L.2	3	3	3	3	3	-	-	3	3	3	1	2	2
24AECE34L.3	3	3	3	3	3	-	-	3	3	3	1	2	2
24AECE34L.4	3	3	3	3	2	-	-	3	3	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: Linear IC Applications
Category: ESC
Semester: IV Semester
Couse Code: 24AECE41T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. This course will provide the student with the ability
2. To understand the Concepts of differential amplifier and OP-Amp
3. To analyze Timers, PLL and converters

Course Outcomes:

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

1. Understand the analysis of differential amplifier and characteristics of OP-Amp.
2. Design Op-Amp circuits for linear applications
3. Design Op-Amp circuits for non-linear applications
4. Understand the applications of 555 timer and PLL.
5. Gain knowledge on data converters.

Unit 1 Introduction to ICs 9

IC Classifications, IC chip size and Circuit complexity, Operational amplifiers: Basic Information of Op-amp, Ideal op-amp, Internal Circuit, DC & AC Characteristics.

Unit 2 Linear applications of OP-AMP 9

Inverting and non-inverting summing amplifier, subtractor, adder-subtractor, integrator, differentiator, instrumentation amplifier, V-I & I-V converters..

Unit 3 Non-Linear Applications of OPAMP 9

Comparators and its applications, Multi vibrators- astable and monostable, Schmitt trigger, Triangular and saw tooth wave generators, Log and antilog amplifiers, precision rectifiers, RC active filters.

Unit 4 Timers and Phase Locked Loops 9

Introduction to 555 Timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL- Introduction, Block schematic, principles and description of individual blocks, 565 PLL, applications of PLL-Frequency multiplication, frequency translation, AM, FM and FSK demodulators.

Unit 5 D-A and A-D Converters 9

Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC, monolithic DAC, ADCs- parallel comparator type ADC, counter type ADC, servo tracking ADC, successive approximation ADC, Dual slope ADC, DAC and ADC specifications.

Prescribed Text Books:

1. Ramakanth A. Gayakwad - Op-Amps & Linear ICs, 3rd edition, PHI, 2001.
2. D. Roy Chowdhury - Linear Integrated Circuits, New Age International (p) Ltd, 4th Edition, 2010.

Reference Books:

1. David A. Bell - Operational Amplifiers & Linear ICs, 2nd edition, Oxford University Press, 2010.
2. Sergio Franco - Design with Operational Amplifiers & Analog Integrated Circuits, McGraw Hill, 1988.

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
24AECE41T.1	3	3	3	3	2	-	-	1	-	-	-	3	2
24AECE41T.2	3	2	2	3	2	-	-	1	-	-	-	2	2
24AECE41T.3	2	3	2	3	2	-	-	1	-	-	-	-	3
24AECE41T.4	1	2	2	3	1	2	2	-	-	-	-	2	-
24AECE41T.5	1	2	2	2	3	-	-	1	-	-	-	3	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

SCHOOL OF MANAGEMENT

MBA DEPARTMENT

To

The Head of the Department,

Department of Electronics and Communication Engineering,

Annamacharya University,

Rajampet, A.P – 516126.

Subject: Submission of Course Structure and Syllabus for II Year B.Tech. I Sem.,

The following is the II Year Course Structure and detailed syllabus offered by the Department of Business Administration for the Academic Year 2025-26 to ECE Department.

S.No.	Category	Course Code	Course Title	Hours Per week			Credits
				L	T	P	
1	MBA	24AMBA21T	Managerial Economics and Financial Analysis	3	0	0	3

We kindly request you to incorporate this structure into your departmental curriculum and circulate the same among faculty and students as applicable.

Kindly acknowledge the receipt of the letter and thank you for your cooperation and support.

Warm regards,

05.07.2025

Head of the Department

ANNAMACHARYA UNIVERSITY, RAJAMPET

Title of the Course	**: Managerial Economics & Financial Analysis**
Category	**: MBA**
Course Code	**: 24AMBA21T**
Year	**: II B. Tech. I Semester Common to CE, EEE**

Course Objectives:

- To inculcate the basic knowledge of microeconomics and Demand
- To make the students learn how demand is estimated for different products, input-output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements.

Course Outcomes:

- Summarize the concepts related to Managerial Economics, financial accounting (L2)
- Comprehend the fundamentals of Economics viz., Production, cost, revenue (L2)
- To examine the different forms of business & market structures (L2)
- Analyze how to invest their capital and maximize returns (L4)
- Develop the accounting statements and evaluate the financial performance of business entity (L5)

UNIT - I Managerial Economics

Introduction – Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.

UNIT - II Production and Cost Analysis

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least- cost combination– Short run and long run Production Function- Iso quants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).

UNIT - III Business Organizations and Markets

Introduction – Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly-Monopolistic Competition– Oligopoly-Price-Output Determination - Pricing Methods and Strategies.

UNIT – IV Capital Budgeting

Introduction – Nature, meaning, significance. T ypes of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features, Proposals, Methods and Evaluation. Projects – Pay Back, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems).

UNIT - V Financiâl Accounting and Analysis

Introduction – Concepts and Conventions- Double-Entry Bookkeeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.

2.. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja HI Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International. 3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources: https://www.slideshare.net/123ps/managerial-economics-ppt https://www.slideshare.net/rossanz/production-and-cost-45827016 https://www.slideshare.net/darkyla/business-organizations-19917607 https://www.slideshare.net/balarajbl/market-and-classification-of-market https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396 https://www.slideshare.net/ashu1983

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	PSO1	PSO2
24AMBA21T.1	2	1	1	-	1	2	-	1	1	2	1	-	-
24AMBA21T.2	2	1	1	1	1	1	1	-	1	1	1	-	-
24AMBA21T.3	1	1	-	1	2	1	1	2	1	1	1	-	-
24AMBA21T.4	1	1	-	1	1	-	1	1	-	1	1	-	-
24AMBA21T.5	-	2	1	1	-	1	-	1	1	-	1	-	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Analog And Digital Communications
Category: PCC
Semester: IV Semester
Couse Code: 24AECE42T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. Introduce various modulation and demodulation techniques of analog and digital communication systems.
2. Analyze different parameters of analog and digital communication techniques.
3. Understand function of various stages of AM, FM transmitters and Know characteristics of AM &FM receivers.
4. Analyze the performance of various digital modulation techniques in the presence of AWGN.

Course Outcomes:

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

1. Recognize the basic terminology used in analog and digital communication technique for transmission of information/data.
2. Explain the basic operation of different analog and digital communication systems at baseband and passband level.
3. Compute various parameters of baseband and passband transmission schemes by applying basic engineering knowledge.
4. Analyze the performance of different modulation & demodulation techniques to solve complex problems in the presence of noise.
5. Evaluate the performance of all analog and digital modulation techniques to know the merits and demerits of each one of them in terms of bandwidth and power efficiency.

Unit 1 Amplitude Modulation: **12**

Need for modulation, Amplitude Modulation - Time and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves - Switching modulator, Detection of AM Waves - Envelope detector, DSBSC modulation - time and frequency domain description, Generation of DSBSC Waves - Balanced Modulators, Coherent detection of DSB-SC Modulated waves, COSTAS Loop, SSB modulation - time and frequency domain description, frequency discrimination and Phase discrimination methods for generating SSB, Demodulation of SSB Waves, principle of Vestigial side band modulation.

Unit 2 Frequency & Phase Modulation: **12**

Basic concepts of Frequency & Phase Modulation, Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave using Bessel functions, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Signal- Armstrong Method, Detection of FM Signal: Balanced slope detector, Phase locked loop, Comparison of FM and AM., Concept of Pre-emphasis and de-emphasis

Unit 3 Transmitters: **12**

Classification of Transmitters, AM Transmitters, FM Transmitters. Receivers: Radio Receiver - Receiver Types - Tuned radio frequency receiver, Super heterodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, Image frequency, AGC, Amplitude limiting, FM Receiver, Comparison of AM and FM Receivers.

Unit 4 Introduction to Noise, Pulse Modulation, Pulse Code Modulation: **10**

Types of Noise, Receiver Model, Noise in AM, DSB, SSB, and FM Receivers.: Types of Pulse modulation- PAM, PWM and PPM. Comparison of FDM and TDM. PCM Generation and Reconstruction, Quantization Noise, Non- Uniform Quantization and Companding, Delta Modulation, DPCM, Noise in PCM and DM.

Unit 5 Digital Modulation Techniques **10**

Coherent Digital Modulation Schemes – ASK, BPSK, FSK, QPSK, Non-coherent BFSK, DPSK. M-ary Modulation Techniques, Power Spectra, Bandwidth Efficiency.
Baseband Transmission and Optimal Reception of Digital Signal: A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Coherent Reception, ISI, Eye Diagrams

Prescribed Textbooks:

1. Simon Haykin, "Communication Systems", John Wiley & Sons, 4th Edition, 2004.
2. B. P. Lathi, Zhi Ding " Modern Digital and Analog Communication Systems", Oxford press, 2011.

Reference Books:

1. Sam Shanmugam, "Digital and Analog Communication Systems",JohnWiley& Sons, 1999.
2. Taub and Schilling, " Principles of Communication Systems", Tata McGraw Hill, 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
24AECE42T.1	3	3	-	-	-	-	-	-	-	-	3	-	-
24AECE42T.2	3	3	-	-	-	-	-	-	-	-	3	-	-
24AECE42T.3	3	3	-	-	-	-	-	-	-	-	3	-	-
24AECE42T.4	3	3	-	-	-	-	-	-	-	-	3	-	-
24AECE42T.5	2	2	-	-	-	-	-	-	-	-	2	-	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Electromagnetic Waves and Transmission Lines
Category: PCC
Semester: IV Semester
Couse Code: 24AECE43T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To understand the Concepts of Vectors and Co-ordinate Systems
2. To learn the concepts of Electric and Magnetic Fields with their corresponding equations.
3. To acquire knowledge on wave propagation in different medias and Transmission lines.

Course Outcomes:

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

1. Learn the concepts of wave theory and its propagation through various mediums.
2. Understand the properties of transmission lines and their applications.
3. Apply the laws & theorems of electrostatic fields to solve the related problem
4. Gain proficiency in the analysis and application of magneto static laws and theorems
5. Analyze Maxwell's equations in different forms.

Unit 1 Electrostatics: **12**

Review of Co-ordinate Systems, Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss Law and Applications, Electric Potential, Maxwell's Two Equations for Electrostatic Fields, Energy Density. Convection and Conduction Currents, Continuity Equation, Dielectric Constant, Poisson's and Laplace's Equations; Capacitance - Parallel Plate, Coaxial Capacitors.

Unit 2 Magneto statics, Maxwell's Equations (Time Varying Fields): **12**

Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magneto static Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy.

Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary Surface.

Unit 3 EM Wave Characteristics: **12**

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossy dielectrics, lossless dielectrics, free space, wave propagation in good conductors, skin depth, Polarization & Types.

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting

Vector and Poynting Theorem.

Unit 4 Transmission Lines - I : **10**

Types, Parameters, T & π Equivalent Circuits, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line, Lossless lines, distortion less lines.

Unit 5 Transmission Lines – II: **10**

Input Impedance Relations, Reflection Coefficient, VSWR, Average Power, Shorted Lines, Open Circuited Lines, and Matched Lines, Low loss radio frequency and UHF Transmission lines, UHF Lines as Circuit Elements, Smith Chart – Construction and Applications, Quarter wave transformer, Single Stub Matching.

Prescribed Textbooks:

1. Elements of Electromagnetics, Matthew N.O. Sadiku, 4th Edition, Oxford University Press, 2008.
2. Electromagnetic Waves and Radiating Systems, E.C. Jordan and K.G. Balmain, 2nd Edition, PHI, 2000.

Reference Books:

1. Electromagnetic Field Theory and Transmission Lines, G. S. N. Raju, 2nd Edition,Pearson Education, 2013.
2. Engineering Electromagnetics, William H. Hayt Jr. and John A. Buck, 7th Edition, Tata McGraw Hill, 2006.

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
24AECE43T.1	3	3	1	1	-	-	-	-	-	-	1	-	-
24AECE43T.2	3	3	1	1	-	-	1	-	-	-	1	-	-
24AECE43T 3	2	2	3	3	-	-	1	-	-	-	1	-	-
24AECE43T.4	3	3	2	2	-	-	-	-	-	-	1	-	-
24AECE43T.5	3	3	2	2	-	-	-	-	-	-	1	-	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Digital System Design using VHDL
Category: PCC
Semester: IV Semester
Couse Code: 24AECE44T
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Understand Concept of logic families & the basics of VHDL
2. To design circuits and implement their functionality using VHDL To analyze the parameters like gain and impedances for single stage amplifier circuits.
3. To have a knowledge on synchronous design methodology.

Course Outcomes:

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

1. Understand the theory of logic families &interfacing
2. Understand the basics of VHDL & programming.
3. Be able to know the concepts of VHDL design modeling
4. Be able to design combinational circuits and implementation using VHDL programming.
5. Be able to design Sequential circuits and implementation using VHDL programming.

Unit 1 CMOS & Bipolar Logic 12

Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families. Bipolar logic, Transistor-Transistor logic, TTL families, CMOS/TTL interfacing, Low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families.

Unit 2 VHDL Elements & Structural Modeling 10

Introduction to HDL, Design flow, Program structure, Basic language elements- Data Objects, Data types, Operators, Functions and procedures, Packages and Libraries. Structural design elements: Introduction, Component declaration, Component instantiation, Examples.

Unit 3 Dataflow & Behavioral Modeling 14

Data flow design elements: Introduction, Concurrent signal assignment statement, Concurrent versus Sequential signal assignment statement, Conditional signal assignment statement and Selected signal assignment statement, Behavioral design elements: Introduction, Entity declaration, Architecture body, Process statement, Variable assignment statement, Signal assignment statement, Wait statement, If statement, Case statement, Null statement, Loop statement, Exit statement, Next statement, Assertion statement, Report statement, Delay models- Inertial delay model, Transport delay model.

Unit 4 Combinational Logic Design 12

Decoders, Encoders, Three state devices, Multiplexers and Demultiplexers, Code Converters, EX-OR gates and Parity circuits, Comparators, Adders & subtractors, ALUs, Combinational multipliers and their VHDL models. Design examples: Barrel shifter, Comparators, Ones counter

Unit 5 Sequential Logic Design **11**

Latches and flip-flops, Counters, Shift register and their VHDL models, Synchronous design methodology, Impediments to synchronous design.

Prescribed Text Books:

1. John F. Wakerly- Digital Design Principles & Practices, PHI/ Pearson Education Asia, 3rd Ed., 2005.
2. J.Bhaskar-VHDL primer, PHI/ Pearson Education Asia, 3rd Ed., 2003

Reference Books:

1. Charles H. Roth Jr- Digital System Design Using VHDL, PWS Publications, 2nd edition, 2008.
2. Kenneth L Short – VHDL for Engineers, Pearson Education 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
24AECE44T.1	3	3	3	1	-	-	-	-	-	-	-	3	2
24AECE44T.2	-	-	2	-	3	-	1	-	-	3	-	3	-
24AECE44T.3	-	-	2	-	3	-	1	-	-	3	-	3	-
24AECE44T.4	1	3	3	2	3	-	-	-	-	3	-	3	3
24AECE44T.5	1	3	3	2	3	-	-	-	-	3	-	3	3

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course:	Environmental Science
Category:	BS
Course Code:	24AENS31T/41T
Branches:	CSE, CSE(AIML), CSE(IOT), EEE, ME / CSE(AI), AIML, CSE(DS), AIDS, CE & ECE
Semester:	III Semester/IV Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
2	-	-	-

Course Objectives: This course aims to raise environmental awareness, promote sustainable practices aligned with the Sustainable Development Goals (SDGs), and highlight the significance of ecosystems and biodiversity. It sensitizes students to major pollution issues and related legislative measures, fosters ethical responsibility and problem-solving skills to tackle environmental challenges, and explains the impact of human population growth on the environment and public health. The course also emphasizes the role of education, information technology, and public policy in promoting environmental sustainability.

Course Outcomes:

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

1. explain how natural resources should be utilised with a focus on sustainability.
2. describe the need to protect ecosystems and biodiversity for future generations.
3. comprehend major pollution problems related to ecosystems.
4. Summarize key environmental issues, sustainable practices, and laws supporting environmental protection in the context of sustainable development goals.
5. explain the effects of population growth on environment and health, and the role of education, IT, and welfare programs in managing them.

Unit 1 Natural resources **7**

Natural Resources: Renewable and non-renewable resources – Forest resources: Uses, deforestation – Water resources: Uses, floods, drought – Mineral resources: Uses, environmental effects of extracting mineral resources– Energy resources: Renewable and non-renewable energy sources (overview only).

Unit 2 Ecosystems, Biodiversity and its conservation **6**

Ecosystems: Producers, consumers and decomposers – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and functions of the following ecosystems: Forest ecosystem and lake ecosystem.

Biodiversity and its conservation: Definition – Values of biodiversity – Hot-spots of biodiversity – Threats to biodiversity – Conservation of biodiversity.

Unit 3 Environmental pollution **5**

Definition, causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.

Self-learning: Genetically modified crops

Unit 4 Social issues and the Environment 6

Sustainable development – Rainwater harvesting – Environmental ethics – Climate change, global warming, acid rain, ozone layer depletion – Air (Prevention and Control of Pollution) Act – Water (Prevention and Control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Environment Protection Act.

Unit 5 Human population and the Environment 6

Population explosion – Family welfare programmes – Environment and human health – Value education – Role of information technology in environment and human health, Field work – Visit to a local area to document environmental assets.

Prescribed Textbooks:

1. Kaushik, Anubha, and C. P. Kaushik. *Perspectives in Environmental Studies*. 6th ed., New Age International Publishers, New Delhi, 2018.
2. Chawla, Shashi. *A Textbook of Environmental Studies*. 1st ed., McGraw Hill Education, New Delhi, 2017.

Reference Books:

1. Joseph, Benny. *Environmental Studies*. 3rd ed., McGraw Hill Education (India), New Delhi, 2017.
2. Dhinakaran, A., and B. Sankaran. *A Textbook of Environmental Studies*. 1st ed., Himalaya Publishing House, Mumbai, 2017.
3. Basu, Mahua, and S. Xavier. *Fundamentals of Environmental Studies*. 1st ed., Cambridge University Press, New Delhi, 2017.
4. Bharucha, Erach. *Textbook of Environmental Studies for Undergraduate Courses*. 2nd ed., Universities Press (India) Pvt. Ltd., New Delhi, 2013.
5. Tiwari, Vijay Kumar. *A Textbook of Environmental Studies*. 1st ed., Himalaya Publishing House, Mumbai, 2017.

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 teamwork	Communication	Project management and finance	Life-long learning
24AENS31T/41T.1	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.2	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.3	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.4	3	2	-	-	-	-	2	-	-	-	3
24AENS31T/41T.5	2	2	-	-	-	-	2	-	-	-	2

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Linear IC Applications Lab
Category: ESC
Semester: IV Semester
Couse Code: 24AECE41L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To generate different types of non-sinusoidal signals
2. To verify the applications of Op-amp

Course Outcomes:

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

1. Verify Linear applications of Op-Amp
2. Verify the operating modes of IC555 timer
3. Design of Active Filters
4. Verify the PLL applications

List of Experiments

1. Adder using Op-amp
2. Subtractor using Op-amp
3. Active Filter Applications - LPF,HPF(First Order)
4. Function Generator using Op-amps
5. Comparator using IC741
6. Monostable operation using IC-555 timer
7. Astable operation using IC-555 timer
8. Schmitt Trigger
9. 4-Bit DAC using Op-amp
10. PLL Applications (AM & FM)

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
24AECE41L.1	2	3	2	2	-	-	2	-	-	-	-	3	-
24AECE41L.2	3	3	2	2	-	-	2	-	-	-	-	3	-
24AECE41L.3	2	2	3	3	-	-	2	-	-	-	-	3	2
24AECE41L.4	2	3	2	2	-	-	2	-	-	-	-	3	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Analog & Digital Communication Lab
Category: PCC
Semester: IV Semester
Couse Code: 24AECE42L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	2	1

Course Objectives:

1. To Discuss the basics of analog and digital modulation techniques.
2. To integrate theory with experiments so that the students appreciate the knowledge gained from the theory course.
3. To design and implement different modulation and demodulation techniques and their applications.
4. To develop cognitive and behavioral skills for performance analysis of various modulation techniques.

Course Outcomes:

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

1. Describe about the usage of equipment/components used to conduct the experiments in analog and digital modulation techniques
2. Conduct the experiment based on the knowledge acquired in the theory about modulation and demodulation schemes
3. Analyze the performance of a given modulation scheme to find the important metrics of the system theoretically.
4. Practice the relevant graphs between important metrics of the system from the observed measurements. Compare the experimental results with that of theoretical ones and infer the conclusions.

LIST OF EXPERIMENTS: (Execute any 10 experiments)

Design the circuits and verify the following experiments taking minimum of six from each section shown below.

Section-A

1. AM Modulation and Demodulation
2. DSB-SC Modulation and Demodulation
3. SSB-SC Modulation and Demodulation
4. FM Modulation and Demodulation
5. PAM Modulation and Demodulation
6. PWM Modulation and Demodulation
7. PPM Modulation and Demodulation

Section-B

1. Sampling Theorem
2. Pulse Code Modulation and Demodulation
3. Delta Modulation
4. Time Division Multiplexing

5. FSK Modulation and Demodulation
6. PSK Modulation and Demodulation
7. DPSK Modulation & Demodulation

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
24AECE42L.1	2	3	1	-	3	2	-	-	3	-	3	3	-
24AECE42L.2	2	3	1	-	3	2	-	-	3	-	3	3	-
24AECE42L.3	2	3	1	-	3	2	-	-	3	-	3	3	-
24AECE42L.4	2	3	1	-	3	2	-	-	3	-	3	3	-
24AECE42L.5	2	3	1	-	3	2	-	-	3	-	3	3	-

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Digital System Design using VHDL Lab
Category: PCC
Semester: IV Semester
Couse Code: 24AECE43L
Branch/es: ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

Course Objectives:

1. To Understand and develop the test bench code for combinational circuits and sequential circuits
2. To make the students Design combinational and sequential circuits
3. To Learn the simulation with truth table through EDA tool

Course Outcomes:

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

1. Develop the VHDL code for combinational circuits and sequential circuits
2. Be able to use different VHDL programming constructs in the design combinational and sequential circuits
3. Simulate various combinational and sequential logic circuits and verify the simulation with truth table through EDA tool

List of the Experiments

Design and Simulation of following experiments with equivalent simulation software using Data Flow, Structural, Behavioral Models (Minimum eight of the following)

1. Design of Logic gates
2. Design of Half adder, Full Adder and Ripple Carry Adder
3. Design of Half Subtractor, Full Subtractor
4. Design of Encoders
5. Design of Decoders
6. Design Mux and Demux
7. Design of Flip-Flops
8. Design of a Comparators
9. Design of One's Counter.
10. Design of Barrel Shifter

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
24AECE43L.1	2	2	-	2	-	2	-	-	2	-	-	2	2
24AECE43L.2	1	2	-	2	-	2	-	-	1	-	-	2	-
24AECE43L.3	2	2	-	2	-	-	1	-	1	-	-	2	2

ANNAMACHARYA UNIVERSITY

Estd. under Andhra Pradesh Private Universities (Establishment and Regulation) Act, 2016

(Formerly Annamacharya Institute of Technology and Sciences, Rajampet)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

18.07.2025

To
The Head of the Department,
Electronics and Communication Engineering,
Annamacharya University.

Subject: Forwarding of Python Programming Syllabus as Recommended by the Board of Studies of Computer Science and Engineering

Dear Sir,

This is to inform you that the syllabus for the subject **'Python Programming'** [24ACSE46L] for II B. Tech II Semester ECE Students offered by the Department of Computer Science and Engineering, has been prepared and duly recommended by the Board of Studies (BOS) of our department.

In this regard, we are forwarding the approved syllabus for your kind reference and necessary academic coordination, especially in case the subject is offered as skill course in your department.

We request you to kindly go through the syllabus and take note of the contents for your department's planning and alignment purposes.

Your cooperation in this academic matter is sincerely appreciated.

Thanking you.

With regards,

Dr. M. Subba Rao
Professor & Head,
Department of CSE,
Annamacharya University

Enclosure: Approved Syllabus
Copy to: Head, ECE
Copy to: Dean, Academics
Copy to: Department for filing

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

Title of the Course:	Python Programming
Category:	Skill Course
Couse Code:	24ACSE46L
Year	II B. Tech
Semester:	II Semester
Branch	ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	0	2	2

Course Objectives: This course will be able to

1. Introduce core programming concepts of Python programming language
2. Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
3. Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications

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

1. Showcase adept command of Python syntax, deftly utilizing variables, data types, control structures, functions, modules, and exception handling to engineer robust and efficient code solutions.
2. Apply Python programming concepts to solve a variety of computational problems.
3. Understand the principles of object-oriented programming (OOP) in Python, including classes, objects, inheritance, polymorphism, and encapsulation, and apply them to design and implement Python programs.
4. Proficient in using commonly used Python libraries and frameworks such as JSON, XML, NumPy, pandas.
5. Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries.

Unit 1 **Introduction to Python Programming** 10

History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook. Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language. Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement

Unit 2 **Functions and Strings** 10

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments. Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings. Lists: Creating Lists, Basic List

1. 2. 3. 4.
5. 6. 7.

Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Unit 3 Dictionaries 10

Dictionaries: Creating Dictionary, Accessing and Modifying key: value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement. Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Unit 4 Files and Object Oriented Programming 10

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules. Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Unit 5 Introduction to Data Science 10

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Reference Books:

1. Gowri shankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

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
24ACSE35L-1	3	3	2	1	2	-	-	-	1	1	1	2	2	-
24ACSE35L-2	3	3	3	2	3	-	-	-	1	1	1	2	3	-
24ACSE35L-3	3	3	3	3	3	-	-	-	2	1	2	3	2	-
24ACSE35L-4	3	3	3	3	3	2	-	-	2	1	2	3	3	-
24ACSE35L-5	3	3	3	3	3	2	2	-	2	2	2	3	3	3

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

Title of the Course:	Python Programming
Category:	Skill Course
Couse Code:	24ACSE46L
Year	II B. Tech
Semester:	II Semester
Branch	ECE

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	0	2	2

Course Objectives: This course will be able to

1. Introduce core programming concepts of Python programming language
2. Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
3. Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications

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

1. Showcase adept command of Python syntax, deftly utilizing variables, data types, control structures, functions, modules, and exception handling to engineer robust and efficient code solutions.
2. Apply Python programming concepts to solve a variety of computational problems.
3. Understand the principles of object-oriented programming (OOP) in Python, including classes, objects, inheritance, polymorphism, and encapsulation, and apply them to design and implement Python programs.
4. Proficient in using commonly used Python libraries and frameworks such as JSON, XML, NumPy, pandas.
5. Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries.

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Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

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Dictionaries: Creating Dictionary, Accessing and Modifying key: value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement. Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Unit 4 Files and Object Oriented Programming 10

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules. Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Unit 5 Introduction to Data Science 10

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

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3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

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
24ACSE35L-1	3	3	2	1	2	-	-	-	1	1	1	2	2	-
24ACSE35L-2	3	3	3	2	3	-	-	-	1	1	1	2	3	-
24ACSE35L-3	3	3	3	3	3	-	-	-	2	1	2	3	2	-
24ACSE35L-4	3	3	3	3	3	2	-	-	2	1	2	3	3	-
24ACSE35L-5	3	3	3	3	3	2	2	-	2	2	2	3	3	3

ANNAMACHARYA UNIVERSITY

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ANNEXURE-II

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Course Structure for M. Tech.-Embedded Systems

Semester I

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	24DESS11T	Embedded system concepts	3	-	-	3
2	PC	24DESS12T	Modern digital system design	3	-	-	3
3	PE		MOOC-1	3	-	-	3
4	PE		MOOC-2	3	-	-	3
5	MC	24DMBA11T	Research methodology and IPR	2	-	-	2
6	AU	24DAUD1AT	English for Research paper Writing	2	-	-	-
		24DAUD1BT	Disaster Management				
		24DAUD1CT	Sanskrit for Technical Knowledge				
		24DAUD1DT	Value Education				
Lab Courses							
7	PL	24DESS11L	Microcontrollers and interfacing lab	-	-	4	2
8	PL	24DESS12L	Digital system design lab	-	-	4	2
						Total	**18**

Semester II

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	24DESS21T	Embedded software design	3	-	-	3
2	PC	24DESS22T	Internet of things and its applications	3	-	-	3
3	PE		MOOC-3	3	-	-	3
4	PE		MOOC-4	3	-	-	3
5	AU	24DAUD2AT	Constitution of India	2	-	-	-
		24DAUD2BT	Pedagogy Studies				
		24DAUD2CT	Stress Management by Yoga				
		24DAUD2DT	Personality Development through Life Enlightenment skills				
Lab Courses							
6	PL	24DESS21L	Advanced Micro-controller Laboratory	-	-	4	2
7	PL	24DESS22L	Internet of things lab	-	-	4	2
8	PS	24DESS21P	Mini Project with Seminar	-	-	2	2
						Total	**18**

9/06/25 9/6/25 9/6/25

Semester III

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PE	MOOC-5		3	-	-	3
2	OE	MOOC-6		3	-	-	3
3	PW	24BECE31P	Dissertation Phase-I	10	-	-	10
						Total	16

Semester IV

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PW	24DECE41P	Dissertation Phase –II	16	-	-	16
						Total	16

Overall Credit Distribution

Semester	Total Credits	Online Credits	Offline Credits
I Semester	18	06	12
II Semester	18	06	12
III Semester	16	06	10
IV Semester	16	--	16
Total	**68**	**18**	**50**

LIST OF MOOC COURSES

Semester I

S.No.	MOOC-1	
	Course Code	Course Title
1	24DESS1AT	EV - Vehicle Dynamics and Electric Motor Drives
2	24DESS1BT	Embedded Sensing, Actuation and Interfacing Systems
3	24DESS1CT	Industrial Automation and Control

S.No.	MOOC-2	
	Course Code	Course Title
1	24DESS1DT	Sensors and Actuators
2	24DESS1ET	Transducers for Instrumentation
3	24DESS1FT	Basics of Semiconductor Microwave Devices

9/06/25 9/6/25 9/6/25 9/6/25 9/6/25

Semester II

S.No.	MOOC-3	
	Course Code	Course Title
1	24DESS2AT	Computer Vision And Image Processing - Fundamentals And Applications
2	24DESS2BT	Deep Learning For Visual Computing
3	24DESS2CT	Industrial Automation and Drives

S.No.	MOOC-4	
	Course Code	Course Title
1	24DESS2DT	Fuzzy Sets, Logic and Systems & Applications
2	24DESS2ET	Optical Fiber Sensors
3	24DESS2FT	Optical Wireless Communications for Beyond 5G Networks and IoT

Semester III

S.No.	MOOC-5	
	Course Code	Course Title
1	24DESS3AT	RF and Microwave Networks
2	24DESS3BT	Communication Networks
3	24DESS3CT	Biomedical Signal Processing

S.No.	OPEN ELECTIVE (MOOC-6)		Offered By
	Course Code	Course Title	
1	24DCIV3AT	Cost Management of Engineering Projects	Civil
2	24DCIV3BT	Industrial Safety	
3	24DEEE3AT	Energy Conversion Systems	EEE
4	24DEEE3BT	Electric Vehicles	
5	24DMEC3AT	Composite materials	Mechanical
6	24DMEC3BT	Operations Research	
7	24DECE3AT	Image Processing	ECE
8	24DECE3BT	Wireless Communication	
9	24DCSE3AT	Artificial Intelligence	CSE
10	24DCSE3BT	Machine Learning	
11	24DMBA3AT	Business Analytics	MBA
12	24DMBA3BT	Project Appraisal and Finance	

Note: All the above-mentioned MOOCs list of courses are tentative depending upon the semester location with MOOCSs calendar and the subject relevant course will be selected by the BOS Chairman and Module Co-Ordinator along with students.

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

SCHOOL OF MANAGEMENT

MBA DEPARTMENT

To

The Head of the Department,

Department of Electronics and Communication Engineering,

Annamacharya University,

Rajampet, A.P – 516126.

Subject: Submission of Course Structure and Syllabus for I Year M.Tech. I Sem.,

The following is the I Year Course Structure and detailed syllabus offered by the Department of Business Administration for the Academic Year 2025-26 to ECE Department.

S.No.	Category	Course Code	Course Title	Hours Per week			Credits
				L	T	P	
1	PCC	24DMBA11T	Research Methodology and IPR	2	0	0	2

We kindly request you to incorporate this structure into your departmental curriculum and circulate the same among faculty and students as applicable.

Kindly acknowledge the receipt of the letter and thank you for your cooperation and support.

Warm regards,

05.07.25

Head of the Department

ECE

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

Title of the Course	RESEARCH METHODOLOGY AND IPR
Category	PCC
Course Code	24DMBA11T

Year	I M TECH
Semester	I Semester
Branch	M TECH

Lecture Hours	Tutorial Hours	Practice Hours	Credits
2	0	0	2

Course Objectives:

- Identify an appropriate research problem in their interesting domain.
- Understand ethical issues understand the Preparation of a research project thesis report.
- Understand the Preparation of a research project thesis report
- Understand the law of patent and copyrights.
- Understand the Adequate knowledge on IPR

Unit 1 INTRODUCTION TO RESEARCH METHODOLOGY **6**

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, scope, and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations.

Unit 2 TECHNICAL WRITING **6**

Effective literature studies approaches, analysis Plagiarism, Research ethics, Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, presentation and assessment by a review committee.

Unit 3 INTELLECTUAL PROPERTY **6**

Retail Pricing Strategies - Approaches for Setting Prices - Price Adjustments - Using Price to Stimulate Retail Sales - Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Unit 4 PATENT RIGHTS **5**

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.

Unit 5 NEW DEVELOPMENTS IN IPR **5**

New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

Prescribed Textbooks:

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students'
2. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"

Reference Books:

1. Ranjit Kumar, 2nd Edition, "Research Methodology: A Step-by-Step Guide for 2. Beginners".
2. Mayall, "Industrial Design", McGraw Hill, 1992.
3. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007
4. Niebel, "Product Design", McGraw Hill, 1974.
5. Asimov, "Introduction to Design", Prentice Hall, 1962.
6. Robert P. Merges, Peter S. Meynell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.

Course Outcomes:

At the end of the course, the student will be able to	Blooms Level of Learning
1. Analyze research related information	L4
2. Follow research ethics.	L3
3. Summarize that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity	L2
4. Understanding that when IPR would take such important place in growth of individuals & nation.	L2
5. Understand that IPR protection provides an incentive to inventors for further research work and investment in R&D.	L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
24DMBA11T.1	3	2	2	1	2	1	-	-	-	-	-	1	2
24DMBA11T.2	3	2	2	1	2	1	-	-	-	-	-	-	2
24DMBA11T.3	3	2	1	1	2	1	-	2	-	-	-	1	2
24DMBA11T.4	3	2	1	1	1	1	-	-	-	-	-	-	2
24DMBA11T.5	3	2	1	1	1	1	-	1	-	-	-	-	2

ANNAMACHARYA UNIVERSITY

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ANNEXURE-III

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

VISION

To become a leading global center for Electronics and Communication Engineering, dedicated to driving technological innovation and adopting new methods, while providing education that supports the progress of society.

MISSION

- To provide a quality education in Electronics and Communication Engineering that promotes research, innovation, and critical thinking skills.
- To develop skilled and ethical professionals by providing an inclusive and supportive learning environment that values integrity and creativity.
- To accelerate technical innovation and improve industry readiness by combining cutting-edge research with hands-on experience, addressing current challenges, and contributing to societal improvement.

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, electronics and communication engineering fundamentals to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment.

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1: Work efficiently as Electronics & Communication Engineers, including supportive and leadership roles on Multidisciplinary teams.

PEO2: Communicate effectively, recognize and incorporate societal needs and constraints in their professional endeavors with high regard to legal and ethical responsibilities.

PEO3: Develop attitude in lifelong learning, applying and adapting new ideas and technologies as their field evolves.

PROGRAM SPECIFIC OUTCOMES

PSO1: Professional Skills: An ability to understand the basic concepts in electronics and communication engineering and to apply them to various areas like electronics, communication, signal processing, VLSI, embedded systems etc., in the design and implementation of complex systems

PSO2: Successful Career and Entrepreneurship: An understanding of social-awareness & environmental-wisdom along with ethical responsibility to have a successful career and to sustain passion and zeal for real-world applications using optimal resources as an entrepreneur.

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ANNEXURE-IV

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course:	Environmental Science
Category:	BS
Course Code:	24AENS31T/41T
Branches:	CSE, CSE(AIML), CSE(IOT), EEE, ME / CSE(AI), AIML, CSE(DS), AIDS, CE & ECE
Semester:	III Semester/IV Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
2	-	-	-

Course Objectives: This course aims to raise environmental awareness, promote sustainable practices aligned with the Sustainable Development Goals (SDGs), and highlight the significance of ecosystems and biodiversity. It sensitizes students to major pollution issues and related legislative measures, fosters ethical responsibility and problem-solving skills to tackle environmental challenges, and explains the impact of human population growth on the environment and public health. The course also emphasizes the role of education, information technology, and public policy in promoting environmental sustainability.

Course Outcomes:

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

1. explain how natural resources should be utilised with a focus on sustainability.
2. describe the need to protect ecosystems and biodiversity for future generations.
3. comprehend major pollution problems related to ecosystems.
4. Summarize key environmental issues, sustainable practices, and laws supporting environmental protection in the context of sustainable development goals.
5. explain the effects of population growth on environment and health, and the role of education, IT, and welfare programs in managing them.

Unit 1 Natural resources **7**

Natural Resources: Renewable and non-renewable resources – Forest resources: Uses, deforestation – Water resources: Uses, floods, drought – Mineral resources: Uses, environmental effects of extracting mineral resources– Energy resources: Renewable and non-renewable energy sources (overview only).

Unit 2 Ecosystems, Biodiversity and its conservation **6**

Ecosystems: Producers, consumers and decomposers – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and functions of the following ecosystems: Forest ecosystem and lake ecosystem.

Biodiversity and its conservation: Definition – Values of biodiversity – Hot-spots of biodiversity – Threats to biodiversity – Conservation of biodiversity.

Unit 3 Environmental pollution **5**

Definition, causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.

Self-learning: Genetically modified crops

Unit 4 Social issues and the Environment 6

Sustainable development – Rainwater harvesting – Environmental ethics – Climate change, global warming, acid rain, ozone layer depletion – Air (Prevention and Control of Pollution) Act – Water (Prevention and Control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Environment Protection Act.

Unit 5 Human population and the Environment 6

Population explosion – Family welfare programmes – Environment and human health – Value education – Role of information technology in environment and human health, Field work – Visit to a local area to document environmental assets.

Prescribed Textbooks:

1. Kaushik, Anubha, and C. P. Kaushik. *Perspectives in Environmental Studies*. 6th ed., New Age International Publishers, New Delhi, 2018.
2. Chawla, Shashi. *A Textbook of Environmental Studies*. 1st ed., McGraw Hill Education, New Delhi, 2017.

Reference Books:

1. Joseph, Benny. *Environmental Studies*. 3rd ed., McGraw Hill Education (India), New Delhi, 2017.
2. Dhinakaran, A., and B. Sankaran. *A Textbook of Environmental Studies*. 1st ed., Himalaya Publishing House, Mumbai, 2017.
3. Basu, Mahua, and S. Xavier. *Fundamentals of Environmental Studies*. 1st ed., Cambridge University Press, New Delhi, 2017.
4. Bharucha, Erach. *Textbook of Environmental Studies for Undergraduate Courses*. 2nd ed., Universities Press (India) Pvt. Ltd., New Delhi, 2013.
5. Tiwari, Vijay Kumar. *A Textbook of Environmental Studies*. 1st ed., Himalaya Publishing House, Mumbai, 2017.

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 teamwork	Communication	Project management and finance	Life-long learning
24AENS31T/41T.1	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.2	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.3	2	2	-	-	-	-	2	-	-	-	2
24AENS31T/41T.4	3	2	-	-	-	-	2	-	-	-	3
24AENS31T/41T.5	2	2	-	-	-	-	2	-	-	-	2

B.Tech

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Title of the Course: Universal Human Values – II
Category: Humanities
Course Code: 24AUHV31T/24AUHV41T
Branches:
Semester: I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives: The course aims to help students recognize the vital interplay between values and skills, promoting sustained happiness and prosperity. It seeks to foster a holistic perspective on life and profession, encouraging value-based living through a clear understanding of human reality and existence. Additionally, the course emphasizes the ethical implications of such an understanding, fostering trustful behaviour, fulfilling human interactions, and a harmonious relationship with nature.

Course Outcomes:
At the end of the course, the student will be able to
1. comprehend the terms like Natural Acceptance, Happiness and Prosperity
2. analyze one's self, and one's surroundings (family, society, nature)
3. apply human values in enriching human relationships and human society.
4. analyze the need for universal human values and harmonious existence.
5. evaluate themselves as socially and ecologically responsible engineers.

Unit 1 Introduction to Value Education 12

Lecture1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)
Lecture2: Understanding Value Education
Tutorial 1: Practice Session1: Sharing about oneself
Lecture 3: Self-Exploration as the Process for Value Education
Lecture4: Continuous Happiness and Prosperity – The Basic Human Aspirations
Tutorial 2: Practice Session2: Exploring Human Consciousness
Lecture 5: Happiness and Prosperity – Current Scenario
Lecture 6: Method to Fulfill the Basic Human Aspirations
Tutorial 3: Practice Session3: Exploring Natural Acceptance

Unit 2 Harmony in the Human Being 8

Lecture 7: Understanding Human being as the co-existence of the self and the body.
Lecture 8: Distinguishing between the needs of the self and the body
Tutorial 4: Practice Session4: Exploring the difference of needs of self and body.
Lecture 9: The body as an instrument of the self
Lecture 10: Understanding harmony in the self
Tutorial 5: Practice Session5: Exploring sources of imagination in the self
Lecture 11: Harmony of the self with the body
Lecture 12: Programme to ensure self-regulation and health
Tutorial 6: Practice Session 6: Exploring harmony of self with the body

Unit 3 Harmony in the Family and Society 8

Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction
Lecture 14: 'Trust' – the Foundational Value in Relationship
Tutorial 7: Practice Session7: Exploring the Feeling of Trust
Lecture 15: 'Respect' – as the Right Evaluation
Tutorial 8: Practice Session 8: Exploring the Feeling of Respect
Lecture 16: Other Feelings, Justice in Human-to-Human Relationship
Lecture 17: Understanding Harmony in the Society
Lecture 18: Vision for the Universal Human Order
Tutorial 9: Practice Session9: Exploring systems to fulfil human goal

Unit 4 Harmony in the Nature/Existence 10

Lecture 19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, Self-Regulation and Mutual Fulfilment among the Four Orders of Nature
Tutorial 10: Practice Session 10: Exploring the Four Orders of Nature
Lecture 21: Realizing Existence as Co-existence at All Levels
Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session11: Exploring Co-existence in Existence

Unit 5 Implications of the Holistic Understanding – A Look at Professional Ethics 10

Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session 12: Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session13: Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession
Tutorial 14: Practice Session14: Exploring Steps of Transition towards Universal Human Order

Practice Sessions for UNIT I – Introduction to Value Education
PS1 Sharing about Oneself
PS2 Exploring Human Consciousness
PS3 Exploring Natural Acceptance
Practice Sessions for UNIT II – Harmony in the Human Being
PS4 Exploring the Difference of Needs of Self and Body
PS5 Exploring Sources of Imagination in the Self
PS6 Exploring Harmony of Self with the Body
Practice Sessions for UNIT III – Harmony in the Family and Society
PS7 Exploring the Feeling of Trust
PS8 Exploring the Feeling of Respect
PS9 Exploring Systems to fulfil Human Goal
Practice Sessions for UNIT IV – Harmony in the Nature (Existence)
PS10 Exploring the Four Orders of Nature
PS11 Exploring Co-existence in Existence
Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at Professional Ethics
PS12 Exploring Ethical Human Conduct
PS13 Exploring Humanistic Models in Education
PS14 Exploring Steps of Transition towards Universal Human Order

Prescribed Textbooks:

1. **The Textbook** - R R Gaur, R Asthana, G P Bagaria. *A Foundation Course in Human Values and Professional Ethics.* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.
2. The Teacher's Manual - R R Gaur, R Asthana, G P Bagaria. *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics.* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

1. A. Nagaraj. *Jeevan Vidya: Ek Parichaya.* Jeevan Vidya Prakashan, Amarkantak, 1999.
2. A.N. Tripathi. *Human Values.* New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi. *The Story of My Experiments with Truth*
5. E. F Schumacher. *Small is Beautiful*

Web Resources:

1. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%201Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3S2%20Respect%20July%2023.pdf
4. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%205-Harmony%20in%20the%20Nature%20and%20Existence.pdf
5. https://fdp-si.aicte-india.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%202325%20Ethics%20v1.pdf
6. https://www.studocu.com/in/document/kiet-group-of-institutions/universal-humanvalues/chapter-5-holistic-understanding-of-harmony-on-professional-ethics/62490385https://onlinecourses.swayam2.ac.in/aic22_ge23/preview
7. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20Family.pdf

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 teamwork	Communication	Project management and finance	Life-long learning
24AUHV31T/41T.1			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.2			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.3			-	-	-	-	3	-	1	-	2
24AUHV31T/41T.4			-	-	-	-	3	-	1	-	3
24AUHV31T/41T.5			-	-	-	2	3	-	1	-	2

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ANNEXURE-V

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

AURAT 2025

ELECTRONICS & COMMUNICATION ENGINEERING

NETWORKS, SIGNALS & SYSTEMS Circuit analysis: Node and mesh analysis, Network Theorems. Time and frequency domain, analysis of linear circuits: RL, RC and RLC circuits, Linear 2-port network parameters, Stardelta transformation. Continuous & Discrete Time signals: Fourier series and Fourier transform, sampling theorem and applications, DFT, z-transform, LTI systems: definition and properties, causality, stability, impulse response, convolution.

ANALOG ELECTRONICS Diffusion & drift current, generation and recombination of carriers, Poisson and continuity equations, P-N junction, Zener diode, Rectifiers, BJT, MOSFET, LED, photo diode and solar cell, clippers, clampers. BJT and MOSFET amplifiers: biasing, small signal analysis, frequency response. Op-amp circuits: Amplifiers, summers, differentiators, integrators, active filters, oscillators.

DIGITAL ELECTRONICS Combinational & Sequential circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, multiplexers, decoders, Latches and flip-flops, counters, shift-registers, finite state machines. Semiconductor memories: ROM, SRAM, DRAM. Introduction of Microprocessor 8086 & Microcontroller 8051: Architecture, Addressing modes, instruction set, interrupts, Programming, Memory and I/O interfacing of 8086.

ANALOG & DIGITAL COMMUNICATIONS Amplitude modulation and demodulation, angle modulation and demodulation super heterodyne receivers, PCM, DPCM, digital modulation schemes (ASK, PSK, FSK), Optical sources: LED, Semiconductor Lasers, Optical fibers: attenuation and dispersion characteristics.

ELECTROMAGNETICS Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector. Wave guides & Antennas: Rectangular and circular wave guides, Antenna Parameters, principles, Dipole and monopole antennas, linear antenna arrays.

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ANNAMACHARYA UNIVERSITY

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ANNEXURE-VI

ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

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

Rajampet, Annamayya District, A.P – 516126, INDIA

LIST OF EXAMINERS

S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	Signals and systems	Dr. B. Saroja	Professor	Dept of ECE, SIETK, Puttut
2		Dr S Mahaboob Basha	Professor	GIT,Nellore
3		Dr B Polaiah	Professor	KLU,Vijayawada
4		Dr.P.Santhosh Kumar	Assistant Professor	Dept of E.C.E, Y.V University, Proddatur.
5		Dr.S.Zahiruddin	Associate Professor	Dept. of E.C.E, KSRM, Kadapa
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	Digital Logic Design	Dr K Sudhakar	Professor	St. John's College of Engg. & Tech., Yemmiganur
2		Dr.S. Venkata Kiran	Associate Professor	Dept of E.C.E, SVPCET, Puttur.
3		Dr K Sudhakar	Professor	St. John's College of Engg. & Tech., Yemmiganur
4		Dr N Sreekanth	Professor	MECW,Hyderabad
5		Dr.K.V.Ramanaiah	Professor	Dept. of ECE, YSR Engg College, Proddutur
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1.	Analog Circuits	Dr.S. Venkata Kiran	Associate Professor	Dept of E.C.E, SVPCET, Puttur.
2.		Dr.M.Chennakesav	Associate Professor	Dept of E.C.E, RGMCET,Nandayal
3.		Dr.P.Amzad Khan	Associate Professor	Dept of E.C.E, GPREC,Kurnool
4.		Dr.K.Sudheer Babu	Associate Professor	Dept of E.C.E, GPREC,Kurnool
5.		Dr.VNV.Satya Prakash	Associate Professor	Dept of E.C.E, RGMCET,Nandayal

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Rajampet, Annamayya District, A.P – 516126, INDIA

S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1.	Linear IC applications	Dr.D.Vishnu vardhan	Professor	Dept of E.C.E, JNTUACE, Ananathapuramu
2.		Dr.T.Lakshmi Narayana	HOD & Associate Professor	Dept of E.C.E, KLMCE,Kadapa
3.		Dr.K.Mahesh Babu	Associate Professor	Dept of E.C.E, SVCE, Tirupathi
4.		Dr.S.Naga Jyothi	Associate Professor	Dept of E.C.E, MITS, Madanapalli
5.		Dr.P.Shamsheer Khan	Associate Professor	Dept of E.C.E, GPRCE, Kurnool
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	Analog and Digital Communications	Dr D Suresh	Professor	RNSIT,Bengaluru
2		Dr.K. Murali	Professor	Dept. of ECE, NEC, Nellore
3		Dr S Mahaboob Basha	Professor	GIT,Nellore
4		Dr S. Shafiulla Basha	Assistant Professor	Dept. of ECE, YVU, Proddatur
5		Dr.M.V.Subramanyam	Professor	Shantiram Engg College, Nandyal
1	Electromagnetic waves and transmission lines	Dr R S Ernest Ravindran	Asst.Prof	KLU,Vijayawada
2		G Sudheer Kumar	Asso.Prof	GPREC,Kurnool
3		Dr K Harikishore	Professor	KLU,Vijayawada
4		Dr P.Janardhana Sai	Associate Professor	Adisankara, Gudur
5		Dr.S.Chandra Mohan reddy	Assistant Professor,	JNTUCEP,Pulivendula
1	Digital System Design Using VHDL	Dr.S.Naga Jyothi	Associate Professor	Dept of E.C.E, MITS, Madanapalli
2		Dr.K.V.Ramanaiah	Professor	Dept. of ECE, YSR Engg College, Proddutur
3		Dr G Sudheer Kumar	Associate Professor	Dept. of ECE, GPREC,Kurnool
4		Dr S Martin	Associate Professor	Dept. of ECE, Karunya University
5		Dr.B.Suresh Babu	Associate Professor	Aditya College of Engineering, Madanapalli

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ANNEXURE-VII

ANNAMACHARYA UNIVERSITY

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

S.NO	H.T. NO	NAME OF THE RESEARCH SCHOLAR	NAME OF THE SUPERVISOR	RESEARCH AREA	RRC MEMBERS
1	24CPECE001	ADINARAYANA NARAPUSETTI	Dr.CH.NAGARAJU	RADAR SIGNAL PROCESSING	Dr.A.SUBBIRAMI REDDY Dr.K.SHANKAR Dr.CH.NAGARAJU
2	24CPECE002	CHINNA NARASIMHA ITTE	Dr.K.PRASAD	MICROWAVE ANTENNAS	Dr.CH.NAGARAJU Dr.K.RIYAZUDDIN Dr.K.PRASAD
3	24CPECE003	CHINNA SANJEEVARAYUDU T	Dr.N.MERRIN PRASANNA	IMAGE AND SIGNAL PROCESSING	Dr.CH.NAGARAJU Dr.FAHIMUDDIN SHAIK Dr.N.MERRIN PRASANNA
4	24CPECE004	HIMABINDHU JALA	Dr.SHAIK KARIMULLAH	VLSI	Dr.CH.NAGARAJU Dr.J.CHINNABABU Dr.SHAIK KARIMULLAH
5	24CPECE005	HUSSAINI T	Dr.CH.NAGARAJU	COMMUNICATION WITH IOT	Dr.C.VENKATESH Dr.K.RIYAZUDDIN Dr.CH.NAGARAJU
6	24CPECE006	JAYASIMHA THUMMALA	Dr.K.RIYAZUDDIN	WIRELESS NETWORKS	Dr.CH.NAGARAJU Dr.K.PRASAD Dr.K.RIYAZUDDIN

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7	24CPECE007	LAKSHMIDEVI BODAGALA	Dr.M.VENKATA DASU	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.C.VENKATESH Dr.M.VENKATA DASU
8	24CPECE008	LYDIA SATHUPATI	Dr.N.MERRIN PRASANNA	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.G.TIRUMALAIAH Dr.N.MERRIN PRASANNA
9	24CPECE009	MYSURA REDDY BANDI	Dr.J.CHINNABABU	IMAGE PROCESSING AND VLSI SYSTEM DESIGN	Dr.CH.NAGARAJU Dr.SHAIK KARIMULLAH Dr.J.CHINNABABU
10	24CPECE010	NAGENDRA PRASAD G	Dr.K.RIYAZUDDIN	WIRELESS COMMUNICATION	Dr.CH.NAGARAJU Dr.K.PRASAD Dr.K.RIYAZUDDIN
11	24CPECE011	RAJEENA SHAIK	Dr.SHAIK KARIMULLAH	VLSI	Dr.CH.NAGARAJU Dr.J.CHINNABABU Dr.SHAIK KARIMULLAH
12	24CPECE012	RAMA KRISHNA KAMMARI	Dr.C.VENKATESH	IMAGE PROCESSING WITH IOT	Dr.CH.NAGARAJU Dr.FAHIMUDDIN SHAIK Dr.C.VENKATESH
13	24CPECE013	RAVIKIRAN VARMA Y	Dr.J.CHINNABABU	VLSI	Dr.CH.NAGARAJU Dr.SHAIK KARIMULLAH Dr.J.CHINNABABU
14	24CPECE014	REDDAPPA PUDI	Dr.K.SHANKAR	VLSI	Dr.CH.NAGARAJU Dr.J.CHINNABABU Dr.K.SHANKAR
15	24CPECE015	SESHIDAR KAMIREDDY	Dr.K.RIYAZUDDIN	IOT	Dr.CH.NAGARAJU Dr.C.VENKATESH

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					Dr.K.RIYAZUDDIN
16	24CPECE016	SHAROUN BUTHURI	Dr.M.VENKATA DASU	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.FAHIMUDDIN SHAIK Dr.M.VENKATA DASU
17	24CPECE017	SIVAYAMINI LAKKISETTY	Dr.FAHIMUDDIN SHAIK	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.M.VENKATA DASU Dr.FAHIMUDDIN SHAIK
18	24CPECE018	SRINIVASARAO CHILAKALA	Dr.C.VENKATESH	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.FAHIMUDDIN SHAIK Dr.C.VENKATESH
19	24CPECE019	TEJASWI MURARRYSETTY	Dr.K.SHANKAR	IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.C.VENKATESH Dr.K.SHANKAR
20	24CPECE020	TEJASWINI P	Dr.CH.NAGARAJU	IOT	Dr.C.VENKATESH Dr.G.TIRUMALAIAH Dr.CH.NAGARAJU
21	24CPECE021	UMAKANTH BASINENI	Dr.FAHIMUDDIN SHAIK	BIO MEDICAL IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.M.VENKATA DASU Dr.FAHIMUDDIN SHAIK
22	24CPECE022	VASU PATTI	Dr.CH.NAGARAJU	WIRELESS COMMUNICATION	Dr.A.SUBBARAMI REDDY Dr.K.SHANKAR Dr.CH.NAGARAJU
23	24CPECE023	VENKATA RAVI KUMAR G	Dr.C.VENKATESH	BIO MEDICAL IMAGE PROCESSING	Dr.CH.NAGARAJU Dr.FAHIMUDDIN SHAIK Dr.C.VENKATESH
24	24CPECE024	VENKATARAMESWAR REDDY I	Dr.J.CHINNABABU	VLSI	Dr.CH.NAGARAJU

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					Dr.SHAIK KARIMULLAH
					Dr.J.CHINNABABU

9/06/25

HEAD OF THE DEPARTMENT

HEAD OF THE DEPARTMENT
ELECTRONICS AND COMMUNICATION ENGINEERING
ANNAMACHARYA UNIVERSITY
RAJAMPET, ANNAMAYYA DIST, A.P

Gmail

AUECEBOS Annamacharya University <aubosece@gmail.com>

BOS-approval

Murty N <nnmurty@iittp.ac.in> Fri, Jun 13, 2025 at 5:33 PM
To: AUECEBOS Annamacharya University <aubosece@gmail.com>
Cc: Balaji Narayanam <prof.balaji.ece@gmail.com>, Sreekanth N <nsreeku@gmail.com>, vikas@technotran.in, syed javeed <syedjaveed221@gmail.com>

Approved from my side.

Thanks & Regards,

Murty

Neti V L Narasimha Murty
Professor
Dept. Electrical Engg
IIT Tirupati
Yerpedu - Venkatagiri Road, Yerpedu Post,
Yerpedu - 517619, Dist. - Tirupati,
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Ph: +91-9439429709
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Web: http://www.iittp.ac.in/dr-n-n-murty

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Gmail AUECEBOS Annamacharya University <aubosece@gmail.com>

BOS-approval

Balaji Narayanam <prof.balaji.ece@gmail.com> Sat, Jun 14, 2025 at 1:08 AM
To: AUECEBOS Annamacharya University <aubosece@gmail.com>
Cc: Sreekanth N <nsreeku@gmail.com>, vikas@technotran.in, Murty N <nnmurty@iittp.ac.in>, syed javeed <syedjaveed221@gmail.com>

Approved from myside

Dr. N. Balaji
Professor of Electronics and Communication Engineering Dept.,
Director (i/c) University Legal Cell & Govt. Initiatives
JNTUK, Kakinada-533003
Mobile Phone:9848115663
9502441555

[Quoted text hidden]

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AUECEBOS Annamacharya University <aubosece@gmail.com>

BOS-approval

Sreekanth N <nsreeku@gmail.com> Sat, Jun 14, 2025 at 12:47 PM
To: vikas technotran <vikas@technotran.in>
Cc: AUECEBOS Annamacharya University <aubosece@gmail.com>, Balaji Narayanam <prof.balaji.ece@gmail.com>, Murty N <nnmurty@iittp.ac.in>, syed javeed <syedjaveed221@gmail.com>

Approved from my side.
[Quoted text hidden]

--
Dr N SREEKANTH,
Professor of ECE
IQAC Coordinator
Malla Reddy Engineering College for Women,
(Autonomus Institution - UGC, Govt. of India) NBA,NAAC-'A+' Grade,
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Secunderabad-14.
Mobile: +91 9603709796.

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AUECEBOS Annamacharya University <aubosece@gmail.com>

BOS-approval

vikas technotran <vikas@technotran.in> Sat, Jun 14, 2025 at 8:00 AM
To: AUECEBOS Annamacharya University <aubosece@gmail.com>
Cc: Balaji Narayanam <prof.balaji.ece@gmail.com>, Sreekanth N <nsreeku@gmail.com>, Murty N <nnmurty@iittp.ac.in>, syed javeed <syedjaveed221@gmail.com>

Thank you for sharing the agenda points. I have reviewed and approved them.

Best Regards
Vikas Reddy Rapuru
Managing Director,
Technotran solutions
[Quoted text hidden]

Gmail

AUECEBOS Annamacharya University <aubosece@gmail.com>

BOS-approval

syed javeed <syedjaveed221@gmail.com> Fri, Jun 13, 2025 at 11:36 PM
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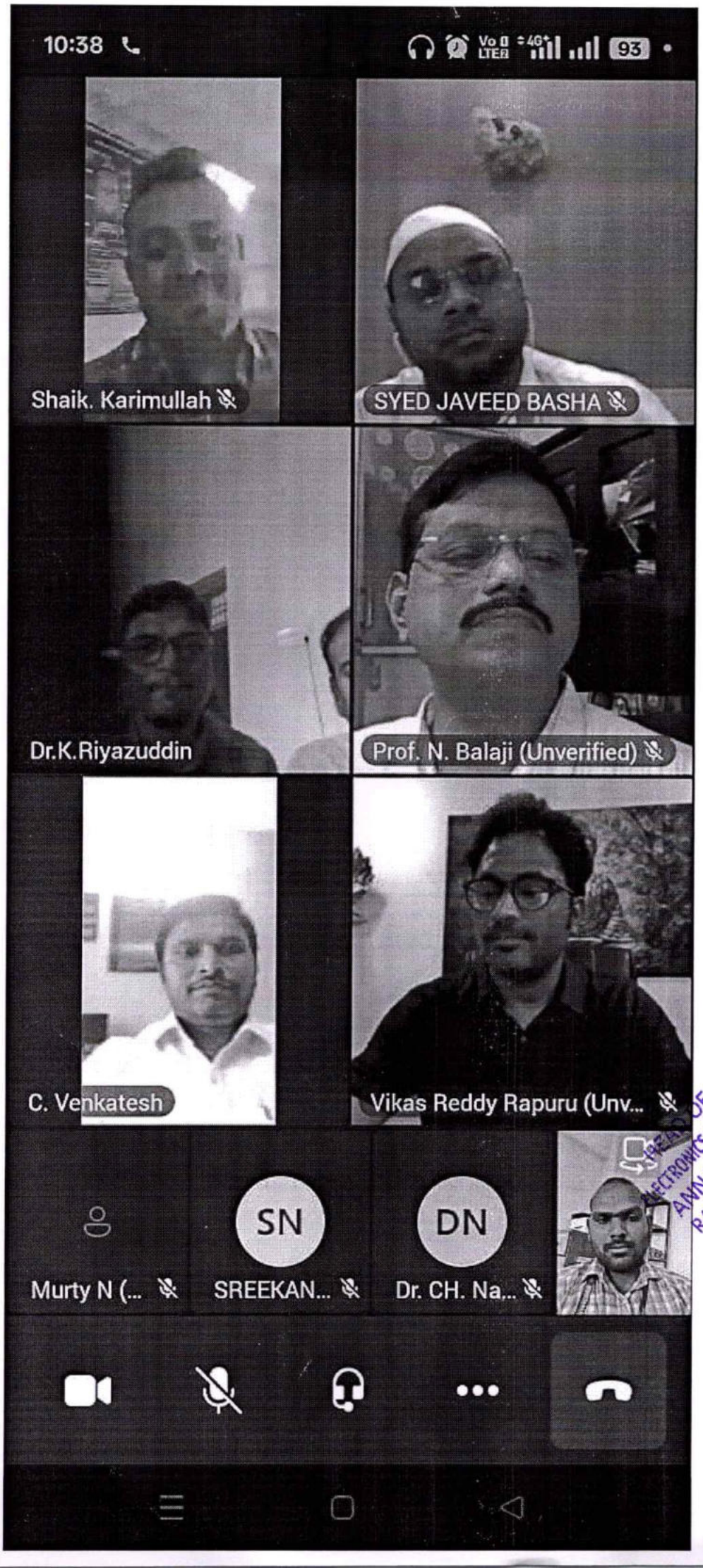
Cc: Balaji Narayanam <prof.balaji.ece@gmail.com>, Sreekanth N <nsreeku@gmail.com>, vikas@technotran.in, nnmurty@iittp.ac.in

I have gone through the shared documents. They are aligned with the discussion happened in BoS Meeting held on 09.06.2025.

I approve from my side.
Thank you all.

Regards
[Quoted text hidden]



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ANNAMACHARYA UNIVERSITY
RAJAMPET, ANNAMAYYA DIST, A.P.