SRI VENKATESWARAA COLLEGE OF TECHNOLOGY
B.H.B Nagar, Vadakal, Oragadam Industrial Corridor, Sriperumbudur - 602 105.
(AN AUTONOMOUS INSTITUTION)

Approved by
AICTE, New Delhi
Affiliated to
Anna University, Chennai

NAAC

SVCT
VADAKAL CAMPUS

(An Autonomous Institution, Affiliated to Anna University, Chennai) BHB Nagar, Vadakal Village, Pondur Post, Sriperumbudur - 602 105

R-2024,CBCS:UGCURRICULUM&Syllabus

Department of ECE
(B.Tech, Advanced Communication Technology)

COLLEGE VISION

To be a premier institution imparting quality technical education in making responsible engineers and entrepreneurs.

COLLEGE MISSION

- To create the state-of-art infrastructure and equipment to install innovation and best practices in teaching, training and research.
- To nurture and strengthen entrepreneurial and skill among students.
- To impart skill of life-long learning, and to enrich ethical and professional behavior of the students.

DEPARTMENT VISION

To Create pioneer in higher learning, skilled, and research-oriented Electronics and Communication Engineering professionals to face the technical and social challenges.

DEPARTMENT MISSION

- To impart eminence in education, research and public service.
- To provide support and encourage the students for professional and software development career.
- To impart quality education and make the students entrepreneur and employable.
- To provide a good ambience which encourages the students to pursue higher education

PROGRAM OUTCOMES (PO)

Engineering Graduates will be able to:

PO-1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution to complex engineering problems.
PO-2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions first principles of mathematics, natural sciences, and engineering sciences.
PO-3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO-4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid Conclusions.
PO-5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO-6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO-7	**Environment and sustainability:** Understand the impact of the professionalengineeringsolutionsinsocietalandenvironmentalcontexts, and demonstrate the knowledge of and need for sustainable development.
PO-8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-9	**Individual and team-work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO-11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply the set own work, as member and leader in a team, to manage projects and in Multi-disciplinary environments.
PO-12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO)

The ECE (Advanced Communication Technology) Graduates will be able to

1. Be proficient and employment-ready with career development skills in both software and hardware through industry-oriented mini & major projects, internships, industry visits, seminars, and workshops to ethically serve the needs of society.

2. Develop hardware/software for components/systems for applications in signal processing, Communication, Networking, Computer-based systems, Embedded Systems & IOT and/or pursue Higher Studies/Research with a strong base in Electronics and Communication Engineering (Advanced Communication Technology).

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- Be highly competent within-depth knowledge in the ECE (Advanced Communication Technology) to have a successful career in Core/IT/Research/Entrepreneurship.
- Design and develop comprehensive and multi-disciplinary projects which require teamwork, leadership, and ethical values taking into consideration legal, social, environmental, and economic issues.
- Analyze and implement solutions in ECE (Advanced Communication Technology)and adapt to changes in technology by continuous learning.

ANNEXURE 1
CATEGORY OF COURSES & CREDIT DISTRIBUTION

	B.E.(ECE-ACT)										
S.No.	**Subject Area**	**Credits per Semester**								**Total Credits**	**Credit in%**
		I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**		
1.	**HSMC**	**4**	**3**	**-**	**3**	**-**	**-**	**3**	**-**	**13**	**9**
2.	**BSC**	**12**	**7**	**4**	**-**	**-**	**-**	**-**	**-**	**23**	**14**
3.	**ESC**	**5**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	**14**	**12**
4.	**PCC**	**-**	**4**	**18**	**17**	**10**	**12**	**8**	**-**	**68**	**35**
5.	**PEC**	**-**	**-**	**-**	**-**	**6**	**6**	**9**	**-**	**21**	**11**
6.	**OEC**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**6**	**6**
7.	**ESEC**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**-**	**8**	
8.	**IEEC**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**10**	**12**	**9**
9.	**SIP**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0**	**0**
10.	**Non-Credit/ (Mandatory)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0**	**0**
	Total	**23**	**24**	**23**	**21**	**20**	**21**	**23**	**10**	**164**	**100**

HSMC–Humanities Social Science & Management Course
BSC–Basic Science Course
ESC–Engineering Science Course
PCC–Professional Core Course
IEEC–Industrial Experience and Enhancement Courses
PEC–Professional Elective Course
OEC–Open Elective Course
ESEC–Employability Skill Enhancement Courses
MC–Mandatory Courses
SIP–Student Induction Program

SEMESTER I

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	S24IP3151	Induction Programme	-	-	-	-	-	**0**
THEORY								
2.	S24HS3151	Professional English – I	HSMC	3	0	0	3	3
3.	S24MA3151	Matrices and Calculus	BSC	3	1	0	4	4
4.	S24PH3151	Engineering Physics	BSC	3	0	0	3	3
5.	S24CY3151	Engineering Chemistry	BSC	3	0	0	3	3
6.	S24GE3151	Problem Solving and Python Programming	ESC	3	0	0	3	3
7.	S24GE3152	தமிழர்மரபு /Heritage of Tamils	HSMC	1	0	0	1	1
PRACTICALS								
8.	S24GE3171	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2
9.	S24BS3171	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
10.	S24HS3171	Communication Skills Laboratory	ESEC	0	0	2	2	2
TOTAL				**16**	**1**	**10**	**27**	**23**

SEMESTER II

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	S24HS3252	Professional English – II	HSMC	2	0	2	4	3
2.	S24MA3251	Statistics and Numerical Methods	BSC	3	1	0	4	4
3.	S24PH3254	Physics of Semiconductor and Optoelectronic Devices	BSC	3	0	0	3	3
4.	S24BE3254	Electrical and Instrumentation Engineering	ESC	3	0	0	3	3
5.	S24GE3251	Engineering Graphics	ESC	2	0	4	6	4
6.	S24EC3251	Electron Devices and Circuit Theory	PCC	3	1	2	6	4
7.	S24GE3252	தமிழரும் ததொழில்நுட்பமும் /Tamils and Technology	HSMC	1	0	0	1	NCC
PRACTICALS								
8.	S24GE3271	Engineering Practices Laboratory	ESC	0	0	4	4	2
9	S24CT3202	Coding Skills - I	ESEC	0	0	2	2	1
TOTAL				**19**	**2**	**14**	**33**	**24**

SEMESTER-III

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODSPER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	S24MA3350	Transforms, Probability & Statistics	BSC	3	1	0	4	4
2.	S24GE3451	Environmental Sciences and sustainability	BSC	3	0	0	3	2
3.	S24AT351	Electromagnetic Theory and Interference	PCC	3	1	0	4	4
4.	S24AT354	Signal Processing	PCC	3	1	0	4	4
5.	S24AT352	Antenna and Wave propagation	PCC	3	0	0	3	3
6.	S24AT353	Linear Integrated Circuits	PCC	3	0	0	3	3
PRACTICALS								
7	S24AT361	Linear Integrated Circuits Laboratory	PCC	0	0	2	2	2
8.	S24CDP032	Cognitive Skills–I	ESEC	0	0	2	2	1
9	S24CDP031	Cognitive Skills – III	ESEC	0	0	2	2	0
TOTAL				**18**	**3**	**6**	**27**	**23**

SEMESTER–IV

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODSPER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	S24AT451	Microprocessor, Microcontroller and Interfacing Techniques	PCC	3	0	0	3	3
2.	S24AT452	Wireless communication Networks	PCC	3	0	0	3	3
3.	S24AT453	Analog and Digital Communication	PCC	3	0	0	3	3
4.	S24AT454	VLSI and Design Technology	PCC	3	0	0	3	3
5.	S24GE3791	Human Values and Ethics	HSMC	3	0	0	3	3
6.	S24AT455	Computer Architecture &Organization	ESC	3	0	0	3	3
PRACTICALS								
7.	S24AT461	Microprocessor, Microcontroller and Interfacing Lab	PCC	0	0	2	2	1
9.	S24AT462	Analog and Digital Communication Lab	PCC	0	0	2	2	1
10.	S24CDP041	Coding skill–IV(Advanced Java)	ESEC	0	0	2	2	1
11.	S24CDP042	Cognitive Skills –II	ESEC	0	0	2	2	0
12.	S24CDP043	Personal Values–II	ESEC	0	0	2	2	0
TOTAL				**18**	**0**	**10**	**28**	**21**

S24HS3152 PROFESSIONALENGLISHI LTPC

3003

COURSEOBJECTIVES:

- Toimprovethecommunicativecompetenceoflearners
- Tolearntousebasicgrammaticstructuresinsuitablecontexts
- Toacquirelexicalcompetenceandusethemappropriatelyinasentenceandunderstand their meaning in a text
- Tohelplearnersuselanguageeffectivelyinprofessionalcontexts
- Todeveloplearners'abilitytoreadandwritecomplextexts,summaries,articles,blogs, definitions, essays and user manuals.

UNITI INTRODUCTIONTOEFFECTIVECOMMUNICATION 9

What is effective communication? (Explain using activities) Why is communication critical for excellence during study, research and work? What are the seven C's of effective communication? What are key language skills? What is effective listening? What does it involve? What is effective speaking? What does it mean to be anexcellent reader? What should you be able to do? What is effective writing?Howdoesonedevelop languageandcommunicationskills?What doesthecourse focus on? How are communication and language skills going to be enhanced during this course? What do you as a learner need to doto enhanceyour English language and communication skills to get the best out of this course?

INTRODUCTIONTOFUNDAMENTALSOFCOMMUNICATION 9

Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contextsand emails. Writing - Writing emails / letters introducing oneself. Grammar - Present Tense(simple and progressive); Question types: Wh/ Yes or No/ and Tags. Vocabulary - Synonyms; One word substitution; Abbreviations & Acronyms (as used in technical contexts).

UNITII NARRATIONANDSUMMATION 9

Reading- Readingbiographies, travelogues, newspaper reports, Excerpts from literature, andtravel & technical blogs. Writing - Guided writing-- Paragraph writing Short Report on an event (field trip etc.) Grammar –Past tense (simple); Subject-Verb Agreement; and Prepositions. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms. Phrasal verbs.

UNITIII DESCRIPTIONOFAPROCESS/ PRODUCT 9

Reading – Reading advertisements,gadget reviews; user manuals. Writing - Writing definitions; instructions; and Product /Process description. Grammar - Imperatives; Adjectives; Degrees of comparison; Present & Past Perfect Tenses. Vocabulary -Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNITIV CLASSIFICATION ANDRECOMMENDATIONS 9

Reading – Newspaper articles; Journal reports –and Non VerbalCommuncation(tables, pie charts etc,.).Writing–Note-making/Note-taking(*Studyskillstobetaught,nottested);Writing recommendations; Transferring information from non verbal(chart , graph etc, to verbal mode) Grammar – Articles; Pronouns - Possessive &Relative pronouns. Vocabulary- Collocations; Fixed / Semi fixed expressions.

UNITV EXPRESSION 9

Reading –Reading editorials; andOpinionBlogs;Writing –EssayWriting(Descriptiveor narrative). Grammar– FutureTenses,Punctuation;Negation(Statements&Questions);andSimple,

Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs Function words.

TOTAL:45PERIODS

LEARNINGOUTCOMES:

Attheendofthecourse,learnerswillbeable

CO1:Touseappropriatewordsinaprofessionalcontext

CO2:Togainunderstandingofbasicgrammaticstructuresandusetheminrightcontext. CO3:To read and infer the denotative and connotative meanings of technical texts CO4:To write definitions, descriptions, narrations and essays on various topics

TEXTBOOKS:

1. EnglishforEngineers&TechnologistsOrientBlackswanPrivateLtd.DepartmentofEnglish, Anna University, (2020 edition)
   EnglishforScience&TechnologyCambridgeUniversityPress,2021.
2. AuthoredbyDr.VeenaSelvam,Dr.SujathaPriyadarshini,Dr.DeepaMaryFrancis,Dr.KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. TechnicalCommunication–PrinciplesAndPracticesByMeenakshiRaman&Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.
2. A Course Book On Technical English By Lakshminarayanan, Scitech Publications (India) Pvt. Ltd.
3. EnglishForTechnicalCommunication(WithCD)ByAyshaViswamohan,McgrawHill Education, ISBN : 0070264244.
4. EffectiveCommunicationSkill,KulbhusanKumar,RSSalaria,KhannaPublishingHouse.
5. LearningtoCommunicate–Dr.V.Chellammal,AlliedPublishingHouse,NewDelhi,2003.

ASSESSMENTPATTERN

Two internal assessments and an end semester examination to test students' reading and writingskills along with their grammatical and lexical competence.

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
2	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
3	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
4	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
5	2	3	3	3	-	3	3	3	2	3	-	3	-	-	-
AVg.	**1.6**	**2.2**	**1.8**	**2.2**	**1.5**	**3**	**3**	**3**	**1.6**	**3**	**3**	**3**	**-**	**-**	**-**

1-low,2-medium,3-high,'-'-nocorrelation

S24MA3151 MATRICESANDCALCULUS LTP C

31 0 4

COURSEOBJECTIVES:

- To develop the use of matrix algebra techniques that are needed by engineers for practical applications.
- Tofamiliarizethestudentswithdifferentialcalculus.

- Tofamiliarizethestudentwithfunctionsofseveralvariables. Thisisneededinmany branches of engineering.
- Tomakethestudentsunderstandvarioustechniquesof integration.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

UNITI MATRICES 9+3

Eigenvalues and Eigenvectorsof a realmatrix –Characteristic equation –Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices byorthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications : Stretchingof anelasticmembrane.

UNITII DIFFERENTIALCALCULUS 9+3

Representationoffunctions-Limitof afunction-Continuity-Derivatives- Differentiationrules(sum, product, quotient, chain rules)- Implicit differentiation - Logarithmic differentiation -Applications : MaximaandMinimaoffunctionsofonevariable.

UNITIII FUNCTIONSOFSEVERALVARIABLES 9+3

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Change of variables –Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Applications :Maxima and minima of functions of two variables andLagrange's method of undetermined multipliers.

UNITIV INTEGRALCALCULUS 9+3

Definite and Indefinite integrals - Substitution rule - Techniques of Integration : Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrationalfunctions - Improper integrals -Applications : Hydrostaticforceand pressure, momentsandcentres ofmass.

UNITV MULTIPLEINTEGRALS 9+3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications :Momentsandcentresofmass, momentofinertia.

TOTAL:60PERIODS

COURSEOUTCOMES:

Attheendofthecoursethestudentswillbeableto

CO1: Use the matrix algebra methods for solving practical problems.

CO2:Applydifferentialcalculustoolsinsolvingvariousapplicationproblems. **CO3**:Able to use differential calculus ideas on several variable functions.

CO4: Applydifferentmethodsofintegrationinsolvingpracticalproblems.

CO5: Applymultipleintegralideasinsolvingareas,volumesandotherpracticalproblems.

TEXTBOOKS:

1. Kreyszig.E,"Advanced Engineering Mathematics", John Wiley and Sons, 10thEdition, NewDelhi, 2016.
2. Grewal.B.S.,"Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44thEdition , 2018.
3. James Stewart, " Calculus :Early Transcendentals ", Cengage Learning, 8th Edition, NewDelhi,2015.[ForUnitsII&IV-Sections1.1,2.2,2.3,2.5,2.7(Tangentsproblemsonly),

2.8,3.1to3.6,3.11,4.1,4.3,5.1(Areaproblemsonly),5.2,5.3,5.4(excludingnet change theorem),5.5,7.1-7.4and7.8].

REFERENCES:

1. Anton.H,Bivens.IandDavis.S,"Calculus",Wiley,10th Edition,2016
2. Bali.N.,Goyal.M.andWatkins.C.,"AdvancedEngineeringMathematics",Firewall Media(An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
3. Jain.R.K. and Iyengar.S.R.K.,"Advanced Engineering Mathematics", NarosaPublications, NewDelhi,5th Edition, 2016.
4. Narayanan. S. and Manicavachagom Pillai. T. K., "Calculus" Volume I and II, S.ViswanathanPublishersPvt.Ltd.,Chennai,2009.
5. Ramana.B.V.,"HigherEngineeringMathematics",McGrawHillEducationPvt.Ltd,New Delhi,2016.
6. SrimanthaPalandBhunia.S.C,"EngineeringMathematics"OxfordUniversityPress, 2015.
7. Thomas.G.B.,Hass.J,andWeir.M.D,"ThomasCalculus",14th Edition,PearsonIndia, 2018.

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO2	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

S24PH3151 ENGINEERINGPHYSICS LTPC
3003

COURSEOBJECTIVES:

- Tomakethestudentseffectivelyachieveanunderstandingofmechanics.
- Toenablethestudentstogainknowledgeofelectromagneticwavesanditsapplications.
- Tointroducethebasicsofoscillations,opticsandlasers.
- Equippingthestudentstosuccessfullyunderstandtheimportanceofquantumphysics.
- Tomotivatethestudentstowardstheapplicationsofquantummechanics.

UNITI MECHANICS 9

Multi-particle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of the system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kineticenergy andmomentofinertia-theorems ofM .I–momentofinertiaofcontinuousbodies–

M.I of a diatomic molecule - torque – rotational dynamics of rigid bodies – conservation of angular momentum – rotational energy state of a rigid diatomic molecule -gyroscope - torsional pendulum– double pendulum –Introduction to nonlinear oscillations.

UNITII ELECTROMAGNETICWAVES 9

The Maxwell's equations - wave equation; Plane electromagnetic waves in vacuum, Conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - Producing electromagnetic waves - Energy and momentum in EM waves:Intensity,wavesfromlocalizedsources,momentumandradiationpressure-Cell-phone

reception. Reflection and transmission of electromagnetic waves from a non-conducting medium- vacuum interface for normal incidence.

UNITIII OSCILLATIONS,OPTICSANDLASERS 9

Simple harmonic motion - resonance –analogy between electrical and mechanical oscillating systems - waves on a string - standing waves - traveling waves - Energy transfer of a wave - sound waves - Doppler effect. Reflection and refraction of light waves - total internal reflection -interference –Michelson interferometer –Theory of air wedge and experiment. Theory of laser - characteristics - Spontaneous and stimulated emission - Einstein's coefficients - populationinversion - Nd-YAG laser, CO_2 laser, semiconductor laser –Basic applications of lasers in industry.

UNITIV BASICQUANTUMMECHANICS 9

Photons and light waves - Electrons and matterwaves –Compton effect - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization –Free particle - particle in a infinite potential well: 1D,2D and 3D Boxes- Normalization, probabilities and the correspondence principle.

UNITV APPLIEDQUANTUMMECHANICS 9

The harmonic oscillator(qualitative)- Barrier penetration and quantum tunneling(qualitative)- Tunneling microscope - Resonant diode - Finite potential wells (qualitative)- Bloch's theorem for particles in a periodic potential –Basics of Kronig-Penney model and origin of energy bands.

TOTAL:45PERIODS

COURSEOUTCOMES:

Aftercompletionofthiscourse,thestudentsshouldbeableto

CO1: Understandtheimportanceofmechanics.

CO2: Expresstheirknowledgeinelectromagneticwaves.

CO3:Demonstrateastrongfoundationalknowledgeinoscillations,opticsandlasers.

CO4:Understandtheimportanceofquantumphysics.

CO5:Comprehendandapplyquantummechanicalprinciplestowardstheformationofenergybands.

TEXTBOOKS:

1. D.Kleppner and R.Kolenkow. An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.
2. E.M.PurcellandD.J.Morin,ElectricityandMagnetism,CambridgeUniv.Press,2013.
3. Arthur Beiser,Shobhit Mahajan,S. Rai Choudhury, Concepts of Modern Physics, McGraw- Hill (Indian Edition), 2017.

REFERENCES:

1. R.Wolfson. Essential University Physics. Volume 1 & 2. Pearson Education (Indian Edition), 2009.
2. PaulA.Tipler,Physic–Volume1&2,CBS,(IndianEdition),2004.
3. K.Thyagarajan and A.Ghatak. Lasers: Fundamentals and Applications, Laxmi Publications, (Indian Edition), 2019.
4. D.Halliday,R.ResnickandJ.Walker.PrinciplesofPhysics,Wiley(IndianEdition),2015.
5. N.Garcia,A.DamaskandS.Schwarz.PhysicsforComputerScienceStudents.Springer- Verlag, 2012.

CO's-PO's&PSO'sMAPPING

CO	PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	1	1	1	-	-	-	-	-	-	-	-	-
2	3	3	2	1	2	1	-	-	-	-	-	-	-	-	-
3	3	3	2	2	2	1	-	-	-	-	-	1	-	-	-
4	3	3	1	1	2	1	-	-	-	-	-	-	-	-	
5	3	3	1	1	2	1	-	-	-	-	-	-	-	-	-
AV	3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

S24CY3151 ENGINEERINGCHEMISTRY LTPC
3003

COURSEOBJECTIVES:

- Toinculcatesoundunderstandingofwaterqualityparametersandwatertreatment techniques.
- Toimpartknowledgeonthebasicprinciplesandpreparatorymethodsofnanomaterials.
- Tointroducethebasicconceptsandapplicationsofphaseruleandcomposites.
- To facilitatetheunderstandingofdifferenttypesoffuels,theirpreparation,properties and combustion characteristics.
- To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.

UNITI WATERANDITSTREATMENT 9

Water: Sourcesandimpurities,Waterqualityparameters: Definitionandsignificanceof-color, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, fluoride and arsenic. Municipal water treatment:primarytreatmentanddisinfection(UV,Ozonation,break-pointchlorination).Desalination of brackish water: Reverse Osmosis. Boiler troubles: Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & foaming. Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralization and zeolite process.

UNITII NANOCHEMISTRY 9

Basics: Distinction between molecules, nanomaterials and bulk materials; Size-dependentproperties (optical, electrical, mechanical and magnetic); Types of nanomaterials: Definition, propertiesandusesof – nanoparticle,nanocluster,nanorod,nanowireandnanotube.Preparationof nanomaterials: sol-gel, solvothermal, laser ablation, chemical vapour deposition, electrochemical deposition and electro spinning. Applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.

UNITIII PHASERULEANDCOMPOSITES 9

Phase rule: Introduction, definition of terms with examples. One component system - water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Thermal analysis; Two component system: lead-silver system - Pattinson process.

Composites: Introduction: Definition & Need for composites; Constitution: Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, flakes and whiskers). Properties and applications of: Metal matrix composites (MMC), Ceramic matrix composites and Polymer matrix composites. Hybrid composites - definition and examples.

UNITIVFUELSANDCOMBUSTION **9**

Fuels: Introduction: Classification of fuels; Coal and coke: Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). Petroleum and Diesel: Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; Power alcohol and biodiesel.

Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; Ignition temperature: spontaneous ignition temperature, Explosive range; Flue gas analysis - ORSAT Method. CO_2emissionand carbon footprint.

UNITVENERGY SOURCESANDSTORAGEDEVICES **9**

Stability of nucleus: mass defect (problems), binding energy; Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion: Principle, working and applications of solar cells; Recent developments in solar cell materials. Wind energy; Geothermal energy; Batteries: Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion- battery; Electric vehicles - working principles; Fuel cells: H_2-O_2fuel cell, microbial fuel cell; Supercapacitors: Storage principle, types and examples.

TOTAL:45PERIODS

COURSEOUTCOMES:

Attheendof thecourse,thestudentswillbe able:

CO1:Toinferthequalityofwaterfromqualityparameterdataandproposesuitabletreatment methodologies to treat water.

CO2: Toidentifyandapplybasicconceptsofnanoscienceandnanotechnologyindesigningthe synthesis of nanomaterials for engineering and technology applications.

CO3:Toapplytheknowledgeofphaseruleandcompositesformaterialselectionrequirements.

CO4: Torecommendsuitablefuelsforengineeringprocessesandapplications.

CO5:To recognize different forms of energy resources and apply them for suitable applications inenergy sectors.

TEXTBOOKS:

1. P. C. Jain and Monica Jain, “Engineering Chemistry”, 17th Edition, Dhanpat Rai PublishingCompany (P) Ltd, New Delhi, 2018.
2. SivasankarB.,“EngineeringChemistry”,TataMcGraw-HillPublishingCompanyLtd,New Delhi, 2008.
3. S.S.Dara,“ATextbookofEngineeringChemistry”,S.ChandPublishing,12thEdition, 2018

REFERENCES:

1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, “Text book of nanoscience and nanotechnology”, Universities Press-IIMSeries in Metallurgyand Materials Science, 2018.
2. O.G. Palanna, “Engineering Chemistry” McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.
3. Friedrich Emich, “Engineering Chemistry”, Scientific International PVT, LTD, New Delhi, 2014.
4. ShikhaAgarwal, “Engineering Chemistry-Fundamentals and Applications”, Cambridge University Press, Delhi, Second Edition, 2019.
5. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	1	-	1	1	-	-	-	-	1	-	-	-
2	2	-	-	1	-	2	2	-	-	-	-	-	-	-	-
3	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	1	1	-	-	1	2	-	-	-	-	-	-	-	-
5	3	1	2	1	-	2	2	-	-	-	-	2	-	-	-
CO	**2.8**	**1.3**	**1.6**	**1**	**-**	**1.5**	**1.8**	**-**		**-**	**-**	**1.5**	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

S24GE3151 PROBLEMSOLVINGANDPYTHONPROGRAMMINGL TP C

3 0 0 3

COURSEOBJECTIVES:

- Tounderstandthebasicsofalgorithmicproblemsolving.
- TolearntosolveproblemsusingPythonconditionalsandloops.
- TodefinePythonfunctionsandusefunctioncallstosolveproblems.
- TousePythondatastructures-lists,tuples,dictionariestorepresentcomplexdata.
- Todoinput/outputwithfilesinPython.

UNITI COMPUTATIONALTHINKINGANDPROBLEMSOLVING 9

Fundamentals of Computing –Identification of Computational Problems -Algorithms, building blocks ofalgorithms(statements,state,controlflow,functions),notation(pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms(iteration,recursion).Illustrativeproblems:findminimuminalist, insert acard in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNITII DATATYPES,EXPRESSIONS,STATEMENTS 9

Python interpreter and interactive mode,debugging;valuesandtypes:int,float,boolean,string, andlist; variables, expressions,statements, tuple assignment, precedence of operators,comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNITIII CONTROLFLOW,FUNCTIONS,STRINGS 9

Conditionals:Boolean values and operators, conditional (if), alternative (if-else),chained conditional (if-elif-else);Iteration: state, while, for, break, continue, pass; Fruitful functions: return values,parameters,localandglobalscope,functioncomposition,recursion;Strings: string slices,immutability, stringfunctionsandmethods,stringmodule;Listsasarrays. Illustrativeprograms: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNITIV LISTS,TUPLES,DICTIONARIES 9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNITVFILES,MODULES, PACKAGES **9**

Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

TOTAL:45 PERIODS

COURSEOUTCOMES:

Uponcompletionofthecourse,studentswillbeableto

CO1:Developalgorithmicsolutionstosimplecomputationalproblems.

CO2:DevelopandexecutesimplePythonprograms.

CO3:WritesimplePythonprogramsusingconditionalsandloopsforsolvingproblems.

CO4:DecomposeaPythonprogramintofunctions.

CO5:RepresentcompounddatausingPythonlists,tuples,dictionariesetc.

CO6:Readandwritedatafrom/tofilesinPythonprograms.

TEXTBOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021
4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. https://www.python.org/
6. MartinC.Brown,"Python:TheCompleteReference",4thEdition,Mc-GrawHill,2018.

CO's-PO's&PSO'sMAPPING

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	2	-	-	-	-	-	2	2	3	3
2	3	3	3	3	2	-	-	-	-	-	2	2	3	-
3	3	3	3	3	2	-	-	-	-	-	2	-	3	-
4	2	2	-	2	2	-	-	-	-	-	1	-	3	-
5	1	2	-	-	1	-	-	-	-	-	1	-	2	-
6	2	2	-	-	2	-	-	-	-	-	1	-	2	-
AVg.	2	3	3	3	2	-	-	-	-	-	2	2	3	3

1-low,2-medium,3-high,'-'-nocorrelation

S24GE3152 HERITAGEOFTAMILS L T P C
1 0 01

UNITI LANGUAGEANDLITERATURE 3

Language Families in India - Dravidian Languages –TamilasaClassical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in SangamLiterature-ManagementPrinciplesin Thirukural-Tamil Epics andImpact of Buddhism &Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNITII HERITAGE-ROCKARTPAINTINGSTOMODERNART–SCULPTURE 3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNITIII FOLKANDMARTIAL ARTS 3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNITIV THINAICONCEPTOFTAMILS 3

FloraandFaunaofTamils&AhamandPuramConceptfromTholkappiyamandSangam Literature
- AramConcept of Tamils - EducationandLiteracyduring SangamAge-Ancient CitiesandPortsof Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT V CONTRIBUTIONOFTAMILSTOINDIANNATIONALMOVEMENTANDINDIAN CULTURE 3

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - RoleofSiddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL:15PERIODS

TEXT-CUM-REFERENCEBOOKS

1. தமிழகவரலொறு–மக்களும்பண்பொடும்–கக·கக·பிள்ளள(தவளியீடு: தமிழ்நொடுபொடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்).
2. கணினித்தமிழ்–முளனவர்இல·சுந்தரம்·(விகடன்பிரசுரம்)·
3. கீழடி– ளவளகநதிக்களரயில்சங்ககொலநகரநொகரிகம்(ததொல்லியல்Fளறதவளியீடு)
4. தபொருளந–ஆற்றங்களரநொகரிகம்·(ததொல்லியல்Fளறதவளியீடு)
5. SocialLifeofTamils(Dr.K.K.Pillay)AjointpublicationofTNTB&ESCandRMRL–(inprint)
6. SocialLifeoftheTamils-TheClassicalPeriod(Dr.S.Singaravelu)(Publishedby: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Publishedby: International Institute of Tamil Studies).
8. TheContributionsoftheTamilstoIndianCulture(Dr.M.Valarmathi)(Publishedby:International Institute of Tamil Studies.)
9. Keeladi-'SangamCityCivilizationonthebanksofriverVaigai'(JointlyPublishedby:

DepartmentofArchaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. StudiesintheHistoryofIndiawithSpecialReferencetoTamilNadu(Dr.K.K.Pillay) (Publishedby: The Author)
11. PorunaiCivilization(JointlyPublishedby:DepartmentofArchaeology&TamilNaduText Bookand Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

S24GE3152தமிழர்மரபுL TP C

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அலகுI<u>மமொழிமற்றும்இலக்கியம்</u>: **3**

இந்தியதமொழிக்குடும்பங்கள்–திரொவிடதமொழிகள்–தமிழ்ஒருதசம்தமொழி–
தமிழ்தசவ்விலக்கியங்கள்-சங்கஇலக்கியத்தின்சமயச்சொர்பற்றதன்ளம–
சங்கஇலக்கியத்தில்பகிர்தல்அறம்– திருக்குறளில்கமலொண்ளமக்கருத்Fக்கள்–
தமிழ்க்கொப்பியங்கள், தமிழகத்தில்சமணதபௌத்தசமயங்களின்தொக்கம்-
பக்திஇலக்கியம்,ஆழ்வொர்கள்மற்றும்நொயன்மொர்கள்–சிற்றிலக்கியங்கள்–
தமிழில்நவீனஇலக்கியத்தின்வளர்ச்சி–
தமிழ்இலக்கியவளர்ச்சியில்பொரதியொர்மற்றும்பொரதிதொசன்ஆகியொரின்பங்களிப்பு.

அலகுIIமரபு–பொறறஓவியங்கள்முதல்நவீனஓவியங்கள்வறர–
சிற்பக்கறல: **3**

நடுகல்முதல்நவீனசிற்பங்கள்வளர– ஐம்தபொன்சிளலகள்–
பழங்குடியினர்மற்றும்அவர்கள்தயொரிக்கும்ளகவிளனப்தபொருட்கள்,தபொம்ளமகள்–
கதர்தசய்யும்களல– சுடுமண்சிற்பங்கள்– நொட்டுப்புறத்ததய்வங்கள்–
குமரிமுளனயில்திருவள்ளுவர்சிளல–இளசக்கருவிகள்–மிருதங்கம்,பளற,
வீளண,யொழ்,நொதஸ்வரம்–
தமிழர்களின்சமூகதபொருளொதொரவொழ்வில்ககொவில்களின்பங்கு.

அலகுIII<u>நொட்டுப்புறக்கறலகள்மற்றும்வீரவிறளயொட்டுகள்</u>: **3**

ததருக்கூத்F, கரகொட்டம், வில்லுப்பொட்டு, கணியொன்கூத்F, ஒயிலொட்டம்,
கதொல்பொளவக்கூத்F, சிலம்பொட்டம், வளரி, புலியொட்டம்,
தமிழர்களின்விளளயொட்டுகள்.

அலகுIV<u>தமிழர்களின்திறைக்ககொட்பொடுகள்</u>: **3**

தமிழகத்தின்தொவரங்களும்,விலங்குகளும்–
ததொல்கொப்பியம்மற்றும்சங்கஇலக்கியத்தில்அகம்மற்றும்புறக்ககொட்பொடுகள்–
தமிழர்கள்கபொற்றியஅறக்ககொட்பொடு– சங்ககொலத்தில்தமிழகத்தில்எழுத்தறிவும்,
கல்வியும்– சங்ககொலநகரங்களும்Fளறமுகங்களும்–
சங்ககொலத்தில்ஏற்றுமதிமற்றும்இறக்குமதி–கடல்கடந்தநொடுகளில்ககொழர்களின்தவற்றி.

- TousePythondatastructures-lists,tuples,dictionaries.
- Todoinput/outputwithfilesinPython.

EXPERIMENTS:

Note: The examples suggested in each experiment are only indicative. The lab instructor is expected to design other problems on similar lines. The Examination shall not be restricted to the sample experiments listed here.

1. EricMatthes,"PythonCrashCourse,AHands-onProjectBasedIntroductiontoProgramming", 2nd Edition, No Starch Press, 2019.
2. https://www.python.org/
3. MartinC.Brown,"Python:TheCompleteReference",4thEdition,Mc-GrawHill,2018.

CO's-PO's&PSO'sMAPPING

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	3	-	-	-	-	-	3	2	3	3
2	3	3	3	3	3	-	-	-	-	-	3	2	3	-
3	3	3	3	3	2	-	-	-	-	-	2	-	3	-
4	3	2	-	2	2	-	-	-	-	-	1	-	3	-
5	1	2	-	-	1	-	-	-	-	-	1	-	2	-
6	2	-	-	-	2	-	-	-	-	-	1	-	2	-
AVg.	**2**	**3**	**3**	**3**	**2**	-	-	-	-	-	**2**	**2**	**3**	**3**

1-low,2-medium,3-high,'-'-nocorrelation

S24BS3171PHYSICSANDCHEMISTRYLABORATORYLTPC
0042

PHYSICSLABORATORY:(AnySevenExperiments)

COURSEOBJECTIVES:

- Tolearntheproperuseof variouskindsofphysicslaboratoryequipment.
- Tolearnhowdatacanbecollected,presentedandinterpretedinaclearandconcise manner.
- Tolearnproblemsolvingskillsrelatedtophysicsprinciplesandinterpretationof experimental data.
- To determine errorin experimental measurementsand techniquesused to minimize such error.
- Tomakethestudentanactiveparticipantineachpartofalllab exercises.

1. Torsionalpendulum-Determinationofrigiditymodulusof wireandmomentofinertiaof regular and irregular objects.
2. Simpleharmonicoscillationsofcantilever.
3. Non-uniformbending-DeterminationofYoung'smodulus
4. Uniformbending–DeterminationofYoung'smodulus
5. Laser-Determinationofthewavelengthofthelaserusinggrating
6. Airwedge-Determinationofthicknessofathinsheet/wire
7. a)Opticalfibre-DeterminationofNumericalApertureandacceptanceangle
   b)Compactdisc-Determinationofwidthofthegrooveusinglaser.
8. Acousticgrating-Determinationofvelocityofultrasonicwavesinliquids.
9. Ultrasonicinterferometer–determinationofthevelocityofsoundandcompressibilityof liquids
10. Postofficebox-DeterminationofBandgapofasemiconductor.
11. Photoelectriceffect
12. MichelsonInterferometer

13. Experimentwithlatticedynamicskit.

TOTAL:30PERIODS

COURSEOUTCOMES:

Upon completion of the course, the students should be able to

CO1:Understandthefunctioningofvariousphysicslaboratoryequipment.

CO2:Use graphical models to analyze laboratory data.

CO3:Usemathematicalmodelsasamediumforquantitativereasoninganddescribingphysical reality.

CO4:Access,processandanalyzescientificinformation.

CO5:Solveproblemsindividuallyandcollaboratively.

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
2	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
3	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
4	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
5	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
AVG	3	2.4	2.6	1	1										

1-low,2-medium,3-high,'-'-nocorrelation

CHEMISTRYLABORATORY:(Anysevenexperimentstobeconducted) COURSE OBJECTIVES:

- Toinculcateexperimentalskillstotestbasicunderstandingofwaterqualityparameters,such as, acidity, alkalinity, hardness, DO, chloride and copper.
- Toinducethestudentstofamiliarizewithelectroanalyticaltechniquessuchas,pHmetry, potentiometry and conductometry in the determination of impurities in aqueous solutions.
- Todemonstratetheanalysisofmetalsandalloys.
- Todemonstratethesynthesisof nanoparticles

1. PreparationofNa$_2$CO$_3$asaprimarystandardandestimationofacidityofawater sample using the primary standard
2. Determinationoftypesandamountofalkalinityinawatersample.
   - Splitthefirstexperimentintotwo
3. Determinationoftotal,temporary&permanenthardnessofwaterbyEDTAmethod.
4. DeterminationofDOcontentofwatersamplebyWinkler'smethod.
5. Determinationofchloridecontentofwatersamplebyargentometricmethod.
6. Estimationofcoppercontentofthegivensolutionbyiodometry.
7. EstimationofTDSofawatersamplebygravimetry.
8. Determinationofstrengthofgivenhydrochloricacidusingph meter.
9. Determinationofstrengthofacidsinamixtureofacidsusingconductivitymeter.
10. Conductometrictitrationofbariumchlorideagainstsodiumsulphate(precipitationtitration)
11. Estimationofironcontentofthegivensolutionusingpotentiometer.
12. Estimationofsodium/potassiumpresentinwaterusingaflamephotometer.
13. Preparationofnanoparticles(TiO$_2$/ZnO/CuO)bySol-Gelmethod.
14. EstimationofNickelinsteel
15. ProximateanalysisofCoal

TOTAL:30 PERIODS

COURSEOUTCOMES:

CO1:Toanalyse the quality of water samples with respect to their acidity, alkalinity, hardnessand DO.
CO2:Todeterminetheamountofmetalionsthroughvolumetricandspectroscopictechniques
CO3:Toanalyseanddeterminethecompositionofalloys.
CO4:Tolearnsimplemethodofsynthesisofnanoparticles
CO5:Toquantitativelyanalysetheimpuritiesinsolutionbyelectroanalyticaltechniques

TEXTBOOKS:

1.J.Mendham,R.C.Denney,J.D.Barnes,M.ThomasandB.Sivasankar,Vogel'sTextbook of Quantitative Chemical Analysis (2009).

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	-	1	-	-	2	2	-	-	-	-	2	-	-	-
2	3	1	2	-	-	1	2	-	-	-	-	1	-	-	-
3	3	2	1	1	-	-	1	-	-	-	-	-	-	-	-
4	2	1	2	-	-	2	2	-	-	-	-	-	-	-	-
5	2	1	2	-	1	2	2	-	-	-	-	1	-	-	-
Avg.	**2.6**	**1.3**	**1.6**	**1**	**1**	**1.4**	**1.8**	**-**	**-**	**-**	**-**	**1.3**	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

Note:theaveragevalueofthiscoursetobeusedforprogramarticulationmatrix.

S24GE3172ENGLISHLABORATORY **L T P C**

00 21

COURSEOBJECTIVES:

- Toimprovethecommunicativecompetenceoflearners
- Tohelplearnersuselanguageeffectivelyinacademic/workcontexts
- Todevelopvariouslisteningstrategiestocomprehendvarioustypesofaudiomaterialslike lectures, discussions, videos etc.
- Tobuildonstudents'Englishlanguageskillsbyengagingtheminlistening,speakingand grammar learning activities that are relevant to authentic contexts.
- Touselanguageefficientlyinexpressingtheiropinionsviavariousmedia.

UNITI INTRODUCTIONTOFUNDAMENTALSOFCOMMUNICATION 6

Listening for general information-specific details- conversation: Introduction to classmates - Audio / video(formal & informal); Telephone conversation; Listening to voicemail & messages; Listening and filling a form. Speaking - making telephone calls-Self Introduction; Introducing a friend; - politeness strategies-making polite requests, making polite offers, replying to polite requests and offers- understanding basic instructions(filling out a bank application for example).

UNITII NARRATIONANDSUMMATION 6

Listening - Listening to podcasts, anecdotes / stories / event narration; documentaries andinterviewswithcelebrities.Speaking -Narratingpersonalexperiences/events-Talkingaboutcurrent andtemporarysituations&permanentandregularsituations* -describingexperiencesandfeelings- engaging in small talk- describing requirements and abilities.

UNITIII DESCRIPTIONOFAPROCESS/PRODUCT 6

Listening - Listen to product and process descriptions; a classroom lecture; and advertisements about products. Speaking – Picture description- describing locations in workplaces- Giving instruction to use the product- explaining uses and purposes- Presenting a product- describing shapes and sizes and weights-talking about quantities(large & small)-talking about precautions.

UNITIV CLASSIFICATION ANDRECOMMENDATIONS 6

Listening– Listening to TED Talks;Listening to lectures - and educational videos. Speaking –Small Talk; discussing and making plans-talking about tasks-talking about progress- talking about positions and directions of movement-talking about travel preparations- talking about transportation-

UNITV EXPRESSION 6

Listening – Listening to debates/ discussions;different viewpoints on an issue; and panel discussions. Speaking –making predictions- talking about a given topic-giving opinions- understanding a website-describing processes

TOTAL:30PERIODS

LEARNINGOUTCOMES:

Attheendofthecourse,learnerswillbeable

CO1:Tolistentoandcomprehendgeneralaswellascomplexacademic information

CO2:Tolistentoandunderstanddifferentpointsofviewina discussion

CO3:To speak fluently and accurately in formal and informal communicative contexts

CO4:Todescribeproductsandprocessesandexplaintheirusesandpurposesclearlyand accurately

CO5:Toexpresstheiropinionseffectivelyinbothformalandinformaldiscussions

ASSESSMENTPATTERN

- Oneonline/appbasedassessmenttotestlistening/speaking
- EndSemester**ONLY**listeningandspeakingwillbeconductedonline.
- Proficiencycertificationisgivenonsuccessfulcompletionoflisteningandspeakinginternal test and end semester exam.

CO's-PO's&PSO'sMAPPING

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
2	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
3	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
4	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
5	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
AVg.	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-

1-low,2-medium,3-high,'-"-nocorrelation

Note: Theaveragevalueofthiscoursetobeusedforprogramarticulationmatrix.

S24HS3252 PROFESSIONALENGLISH-II LTPC
200 2

COURSEOBJECTIVES:

- Toengagelearnersinmeaningfullanguageactivitiestoimprovetheirreadingandwriting skills
- To learn various reading strategies and apply in comprehending documents in professional context.
- Tohelplearnersunderstandthepurpose,audience,contextsofdifferenttypesofwriting
- Todevelopanalyticalthinkingskillsforproblemsolvingincommunicativecontexts
- Todemonstrateanunderstandingofjobapplicationsandinterviewsforinternshipand placements

UNITI MAKINGCOMPARISONS 6

Reading-Reading advertisements, user manuals, brochures; Writing–Professional emails, Email etiquette - Compare and Contrast Essay; Grammar – Mixed Tenses, Prepositional phrases

UNITIIEXPRESSINGCAUSALRELATIONSINSPEAKINGANDWRITING 6

Reading- Reading longer technical texts–Cause and Effect Essays, and Letters / emails of complaint, Writing - Writing responses to complaints. Grammar -Active Passive Voice transformations, Infinitive and Gerunds

UNITIII PROBLEMSOLVING 6

Reading- Case Studies, excerpts from literary texts, news reports etc. Writing –Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay. Grammar –Error correction; If conditional sentences

UNITIV REPORTINGOFEVENTSANDRESEARCH 6

Reading–Newspaper articles; Writing–Recommendations, Transcoding, Accident Report, Survey Report Grammar – Reported Speech, Modals Vocabulary – Conjunctions- use of prepositions

UNITV THEABILITYTOPUTIDEASORINFORMATIONCOGENTLY 6

Reading –Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals;Writing –Job / Internship application – Cover letter & Resume; Grammar –Numerical adjectives, Relative Clauses.

TOTAL:30 PERIODS

COURSEOUTCOMES:

Attheendofthecourse,learnerswillbeable

CO1:Tocompareandcontrastproductsandideasintechnicaltexts.

CO2:To identify and report cause and effects in events, industrial processes through technical texts

CO3:Toanalyseproblemsinordertoarriveatfeasiblesolutionsandcommunicatetheminthe written format.

CO4:Topresenttheirideasandopinionsinaplannedandlogicalmanner

CO5:Todrafteffectiveresumesinthecontextofjobsearch.

TEXTBOOKS:

1. EnglishforEngineers&Technologists (2020edition)OrientBlackswanPrivateLtd. Department of English, Anna University.
2. EnglishforScience&TechnologyCambridgeUniversityPress2021.
3. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCEBOOKS:

1. Raman.Meenakshi,Sharma.Sangeeta(2019).ProfessionalEnglish.Oxforduniversitypress. New Delhi.
2. ImproveYourWritinged.V.N.AroraandLaxmiChandra,OxfordUniv.Press,2001, NewDelhi.
3. LearningtoCommunicate–Dr.V.Chellammal.AlliedPublishers,NewDelhi, 2003
4. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
5. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.

ASSESSMENTPATTERN

Two internal assessments and an end semester examination to test students' reading and writingskills along with their grammatical and lexical competence.

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
2	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
3	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
4	3	3	3	3	2	3	3	3	2	3	3	3	-	-	-
5	-	-	-	-	-	-	-	-	**3**	**3**	**3**	**3**	-	-	-
AVg.	**3**	**3**	**3**	**3**	**2.75**	**3**	**3**	**3**	**2.2**	**3**	**3**	**3**	-	-	-

1-low,2-medium,3-high,'-"-nocorrelation

Note: Theaveragevalueofthiscoursetobeusedforprogramarticulationmatrix.

S24MA3251 STATISTICSANDNUMERICALMETHODS LTPC

310 4

COURSEOBJECTIVES:

- This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds ofproblems occurring in engineering and technology.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- Tointroducethebasicconceptsofsolvingalgebraicandtranscendentalequations.
- To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

UNITI TESTINGOFHYPOTHESIS 9+3

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) –Testsfor singlevarianceandequalityof variances –Chisquaretestforgoodness of fit – Independence of attributes.

UNITII DESIGNOFEXPERIMENTS 9+3

Onewayandtwo wayclassifications - Completelyrandomizeddesign –Randomizedblock design– Latin square design - 2^2 factorial design.

UNITIIISOLUTIONOFEQUATIONSANDEIGENVALUE PROBLEMS 9+3

Solution of algebraic and transcendental equations - Fixed point iteration method – NewtonRaphson method- Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method and Jacobi's method for symmetric matrices.

UNIT IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION 9+3

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivates using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNITVNUMERICALSOLUTIONOFORDINARYDIFFERENTIALEQUATIONS 9+3

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods:Milne's and Adams - Bash forth predictor corrector methods for solving first order differential equations.

TOTAL:60 PERIODS

COURSEOUTCOMES:

Uponsuccessfulcompletionofthecourse,studentswillbeable to:

CO1:Apply the concept oftesting of hypothesis for small and large samples in real life problems. CO2:Apply the basic concepts of classifications of design of experiments in thefield of agriculture.

CO3:Appreciatethenumericaltechniquesofinterpolationinvariousintervalsandapplythe numerical techniques of differentiation andintegration for engineering problems.

CO4:Understandtheknowledgeofvarioustechniquesandmethodsforsolvingfirstandsecond order ordinary differential equations.

CO5:Solve thepartial andordinarydifferential equations with initial and boundary conditions byusing certain techniques with engineering applications.

TEXTBOOKS:

1. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.
2. Johnson,R.A.,Miller,IandFreundJ.,"MillerandFreund'sProbabilityandStatisticsfor Engineers", Pearson Education, Asia, 8th Edition, 2015.

REFERENCES:

1. Burden,R.LandFaires,J.D,"NumericalAnalysis",9thEdition,CengageLearning,2016.
2. Devore.J.L.,"ProbabilityandStatisticsforEngineeringandtheSciences",Cengage Learning, New Delhi, 8th Edition, 2014.
3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007.
4. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand& Sons, New Delhi, 12th Edition, 2020.
5. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability andStatistics ", Tata McGraw Hill Edition, 4th Edition, 2012.
6. Walpole.R.E.,Myers.R.H.,Myers.S.L.andYe.K.,"ProbabilityandStatisticsfor Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.

CO's-PO's&PSO'sMAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO2	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

S24PH3254 PHYSICS OF SEMICONDUCTOR AND OPTOELECTRONIC DEVICES L T P C
3 0 0 3

Unit 1 ELECTRICAL PROPERTIES OF THE MATERIALS 9

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression – Density of Energy states-Quantum free electron theory -Electron in periodic potential – Energy bands in solids

Unit 2 SEMICONDUCTORS AND TRANSPORT PHYSICS 9

Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – Carrier transport in Semiconductors: Drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

Unit 3 MAGNETIC & DIELECTRIC MATERIALS 9

Magnetic materials: Dia, para and ferromagnetic effects – paramagnetism in the conduction electrons in metals – exchange interaction and ferromagnetism – quantum interference devices – GMR devices. Polarization mechanisms: electronic, ionic, orientational, interfacial and total polarization – frequency dependence – local field and Clausius-Mossetti equation – dielectric constant and dielectric loss

Unit 4 OPTOELECTRONIC DEVICES 9

Classification of optical materials – Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain Optoelectronic devices: light detectors and solar cells – light emitting diode – laser diode – optical processes in organic semiconductor devices – excitonic state – Electro-optics and nonlinear optics: Modulators and switching devices .

Unit 5 NANO DEVICES 9

Significance between Fermi energy and volume of the material – Quantum confinement – Quantum structures – Density of states for quantum wells, wires and dots –Band gap of nanomaterials –Tunneling – Single electron phenomena – Single electron Transistor-Carbon nanotubes: Properties and applications - Spintronic devices and applications – Optics in quantum structures – quantum well laser.

REFERENCES:

1. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian
2. R.F.Pierret. Semiconductor Device Fundamentals. Pearson (Indian Edition), 2006.Kenneth Krane Modern Physics, 2010, Wiley Indian Edition.
3. G.W.Hanson. Fundamentals of Nanoelectronics. Pearson Education (Indian Edition), 2009.
4. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
5. https://archive.nptel.ac.in/courses/108/108/108108122/
6. https://onlinecourses.nptel.ac.in/noc20_ph24/preview

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
2	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
3	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-

4	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
5	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
CO	**2**	**1**	**1**	-	-	-	-	**1**	-	-	-	-	-	-	-

1-low,2-medium,3-high,'-'-nocorrelation

S24BE3254 ELECTRICALANDINSTRUMENTATIONENGINEERING LTPC 3003

COURSEOBJECTIVES:

- Toimpartknowledgeintypes,constructionandworkingoftransformers
- Toimpartknowledgeintypes,constructionandworkingofDCmachines
- Toimpartknowledgeintypes,constructionandworkingofACrotatingmachines
- Tointroducethefunctionalelementsandworkingofmeasuringinstruments.
- Tointroducethebasicsofpowersystemandprotectionschemes

UNITI TRANSFORMER 9

Introduction - Ideal and Practical Transformer – Phasor diagram-– Per Unit System – Equivalent circuit- Testing- Efficiency and Voltage Regulation– Three Phase Transformers –Applications- Auto Transformers, Advantages- Harmonics.

UNITII DCMACHINES 9

Introduction – Constructional Features– Motor and Generator mode- EMF and Torque equation – Circuit Model – Methods of Excitation- Characteristics – Starting and Speed Control – Universal Motor- Stepper Motors – Brushless DC Motors- Applications

UNITIII ACROTATINGMACHINES 9

Principle of operation of three-phase induction motors – Construction –Types – Equivalent circuit, Speed Control - Single phase Induction motors -Construction– Types–starting methods. Alternator: Working principle–Equation of induced EMF – Voltage regulation, Synchronous motors- working principle-starting methods – Torque equation.

UNITIV MEASUREMENTSANDINSTRUMENTATION 9

Functional elements of an instrument , Standards and calibration, Operating Principle , types - Moving Coiland MovingIronmeters, Measurement of threephase power,EnergyMeter,Instrument Transformers-CT andPT,DSO-Block diagram- Data acquisition.

UNITV BASICSOFPOWERSYSTEMS 9

Power system structure -Generation , Transmission and distribution , Various voltage levels, Earthing – methods of earthing, protective devices- switch fuse unit- Miniature circuit breaker- moulded case circuit breaker- earth leakage circuit breaker, safety precautions and First Aid

TOTAL:45PERIODS

COURSEOUTCOMES:

Aftercompletingthiscourse,thestudentswillbeableto

CO1: Explaintheworkingprincipleofelectricalmachines

CO2: Analyzetheoutputcharacterizesofelectricalmachines

CO3: Choose the appropriate electrical machines for various applications **CO4:**Explainthetypesandoperatingprinciplesofmeasuringinstruments **CO5:**Explain the basic power system structure and protection schemes

TEXTBOOKS:

1. Kothari DP and I.J Nagrath, “Basic Electrical and Electronics Engineering”, Second Edition, McGraw Hill Education, 2020
2. S. K, Bhattacharya, “Basic Electrical and Electronics Engineering”, Second Edition, Pearson Education, 2017.
3. A.K.Sawhney,PuneetSawhney‘ACourseinElectrical&ElectronicMeasurements& Instrumentation’,DhanpatRaiandCo,NewDelhi,2015.
4. C.L.Wadhwa,“Generation,DistributionandUtilisationofElectricalEnergy”,NewAge International pvt.ltd.,2003

REFERENCES:

1. KothariDPandI.JNagrath,“BasicElectricalEngineering”,FourthEdition,McGrawHill Education, 2019
2. MahmoodNahviandJosephA.Edminister,“ElectricCircuits”,Schaum’OutlineSeries, McGraw Hill, 2002.
3. H.S.Kalsi,‘ElectronicInstrumentation’,TataMcGraw-Hill,NewDelhi,2010

CO’s-PO’s&PSO’sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
2	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
3	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
4	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
5	2	1	1	-	-	-	-	1	-	-	-	-	-	-	-
CO	**2**	**1**	**1**	-	-	-	-	**1**	-	-	-	-	-	-	-

1-low,2-medium,3-high,‘-'-nocorrelation

S24GE3251 ENGINEERINGGRAPHICS LTP C
204 4

COURSEOBJECTIVES:

Themainlearningobjectiveofthiscourseistopreparethestudentsfor:

- Drawingengineeringcurves.
- Drawingfreehandsketchofsimpleobjects.
- Drawingorthographicprojectionofsolidsandsectionofsolids.
- Drawingdevelopmentofsolids
- Drawingisometricandperspectiveprojectionsofsimplesolids.

CONCEPTSANDCONVENTIONS(NotforExamination)

Importance of graphics in engineering applications — Use of drafting instruments —BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNITI PLANECURVES 6+12

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola byeccentricitymethod —Construction ofcycloid —construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNITII PROJECTIONOF POINTS,LINESANDPLANESURFACE 6+12

Orthographic projection - principles - Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNITIII PROJECTIONOFSOLIDSANDFREEHANDSKETCHING 6+12

Projectionofsimplesolidslikeprisms,pyramids,cylinder,coneandtruncatedsolidswhentheaxisis inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles —Representation ofThree Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects.

Practicingthreedimensionalmodelingofsimpleobjectsby CADSoftware(Notforexamination)

UNITIV PROJECTIONOFSECTIONEDSOLIDSANDDEVELOPMENTOF SURFACES 6+12

Sectioning of abovesolids insimple verticalposition whenthecutting planeisinclinedtotheone of theprincipalplanesandperpendiculartotheother—obtainingtrueshapeofsection.Developmentof lateralsurfacesofsimpleand sectioned solids—Prisms,pyramidscylindersandcones.

Practicingthreedimensionalmodelingofsimpleobjectsby CADSoftware(Notforexamination)

UNITV ISOMETRICANDPERSPECTIVEPROJECTIONS 6+12

Principles of isometric projection — isometric scale —lsometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)

TOTAL:(L=30+P=60)90PERIODS

COURSEOUTCOMES:

On successful completion of this course, the student will be able to

CO1:UseBISconventionsandspecificationsforengineeringdrawing

CO2:Construct the conic curves, involutes and cycloid.
CO3:Solvepracticalproblemsinvolvingprojectionoflines.
CO4:Drawtheorthographic,isometricandperspectiveprojectionsofsimplesolids.
CO5:Drawthedevelopmentofsimplesolids.

TEXTBOOKS:

1. Bhatt N.D. andPanchal V.M., "Engineering Drawing", Charotar Publishing House, 53Edition, 2019.
2. Natrajan K.V., "AText Book of EngineeringGraphics",Dhanalakshmi Publishers, Chennai, 2018.
3. Parthasarathy,N.S.andVelaMurali,"EngineeringDrawing",OxfordUniversityPress, 2015

REFERENCES:

1. BasantAgarwalandAgarwalC.M.,"EngineeringDrawing",McGrawHill,2nd Edition,2019.
2. Gopalakrishna K.R.,"Engineering Drawing" (Vol.I&IIcombined),SubhasPublications,Bangalore, 27th Edition,2017.
3. Luzzader, Warren.J. and Duff,John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5. ShahM.B.,andRanaB.C.,"EngineeringDrawing",PearsonEducationIndia,2nd Edition,2009.
6. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.

PublicationofBureauofIndianStandards:

1. IS10711—2001:TechnicalproductsDocumentation—Sizeandlayoutofdrawingsheets.
2. IS9609(Parts0&1)—2001:TechnicalproductsDocumentation—Lettering.
3. IS10714(Part20)—2001&SP46—2003:Linesfortechnicaldrawings.
4. IS11669—1986&SP46—2003:DimensioningofTechnicalDrawings.
5. IS15021(Parts1to4)—2001:Technicaldrawings—ProjectionMethods.

SpecialpointsapplicabletoUniversityExaminationsonEngineeringGraphics:

1. Therewillbefivequestions,eachofeitherortypecoveringallunitsofthesyllabus.
2. Allquestionswillcarryequalmarksof20eachmakingatotalof100.
3. Theanswerpapershallconsistofdrawingsheetsof A3sizeonly.Thestudentswillbe permitted to useappropriate scale to fit solution within A3 size.
4. Theexaminationwillbeconductedinappropriatesessionsonthesameday

CO's-PO's&PSO'sMAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
2	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
3	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
4	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
5	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO	**3**	**1**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**2**	**2**	**-**

1-low,2-medium,3-high,'-'-nocorrelation

S24EC3251 ELECTRONDEVICESANDCIRCUIT THEORY L T P C
3 0 2 4

COURSEOBJECTIVES:

- Todiscussthebehaviorofsemiconductordiodesinvarious applications.
- TofamiliarizetheoperationofBJT, FET, MOSFET and AMPLIFIER.
- Toconstructsimpleelectroniccircuitsusingspecialsemiconductordevices.
- Tounderstandthe fundamentallawsofelectriccircuits.
- Toanalyzetheresponseofelectriccircuitsusingnetworktheorems.

UNITI INTRODUCTION 9+6

PNjunctiondiode,Currentequations,EnergyBanddiagram,Diffusionanddriftcurrentdensities,

Forward andreversebiascharacteristics,TransitionandDiffusionCapacitances,V-I and SwitchingCharacteristics,BreakdowninPNJunctionDiodes,Rectifiers – Half Wave and Full WaveRectifier, Zenerdiodeanditsapplications.

Experiments

VIcharacteristicsofPNdiode
VIcharacteristicsofZenerdiode

UNITII TRANSISTORS 9+6

BipolarJunctionTransistor-NPN-PNP–Operations-Earlyeffect–CurrentEquations-InputandOutput Characteristicsof CE,CB,CC– FET,MOSFET Characteristics.

Experiments

3. InputandoutputcharacteristicsofCEConfiguration.
4. CharacteristicsofJFET

UNITIII SPECIALSEMICONDUCTORDEVICESANDAPPLICATIONS 9+6

Tunneldiode, Varactordiode,UJT,SCR,DIAC,TRIAC,PowerBJT-PowerMOSFET-MOS-VMOS.LED,Phototransistor,OptoCoupler.

Experiments

VIcharacteristicsof UJT.

VIcharacteristicsofSCR

UNITIV BASICCIRCUITANALYSIS 9+6

Resistive elements - Ohms Law- Kirchhoff's current and voltage laws - series and parallel connection ofindependent sources - R, L and C, source transformation, Mesh current and Node voltage with DCAnalysis-methodsofanalysis,stardeltaconversion.TransientresponseofRL,RCandRLCcircuitsusingLaplace Transformfor DC inputandACsinusoidalinput.

Experiments

7(a).VerificationofKirchhoff'scurrentlaw.

7(b). VerificationofKirchhoff'svoltagelaw.

UNITV NETWORKTHEOREMS 9+6

ThevenindNortonTheorems-SuperpositionTheorem-Maximumpowertransfertheorem-ReciprocityTheorem.

Experiments

1. Verificationofsuperpositiontheorem.
2. VerificationofThevenin'stheorem.
3. VerificationofNorton'stheorem.

COURSEOUTCOMES:

UponCompletionofthecourse,thestudents will beableto:

CO1: Examine theperformanceof electroniccircuitsusing PN junction diodeandZener diode.

CO2: Construct electronic circuits using BJT, FET and MOSFET Amplifiers tosketch theinputandoutput characteristics.

CO3:Demonstrate thebehaviorofspecialsemiconductordevicesinvariousapplications.

CO4:Comprehendtheimpactofvoltageandcurrentinelectriccircuitsusing Mesh&Nodalmethods.

CO5:Relatevariousnetworktheoremsto determinetheresponse oftheelectric circuits.

TEXTBOOKS:

1.CharlesK.Alexander,MatthewN.O.Sadiku,FundamentalsofElectricCircuits,7th Edition, McGrawHill, 2022.

2.David A. Bell, "Electronic Devices and Circuits", Oxford Higher Education press, 5 th Edition, 2010.

3.Robert L. Boylestad, Louis Nashelsky, Electronic Devices andCircuitTheory, 11thEdition,2017

REFERENCES

1. JosephEdministerandMahmoodNahvi,—ElectricCircuits,Schaum'sOutlineSeries,5thEditionReprint,TataMcGrawHillPublishingCompany,NewDelhi,2016.
2. DavidABell,ElectricCircuitsandElectronicDevices,OxfordUniversityPress,2010

CO's-PO's & PSO's MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	-	-	-	1	-	1	-	-	-	-	-
2	3	3	2	2	-	-	-	1	-	1	-	-	-	-	-
3	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
4	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
5	3	3	3	2	-	-	-	1	-	1	-	-	-	-	-
CO	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**1**	-	**1**	**-**	**-**	**-**	**-**	**-**

1-low,2-medium,3-high,'-'-nocorrelation

GE3252 TAMILS AND TECHNOLOGY LTP C
100 1

UNITI WEAVINGANDCERAMICTECHNOLOGY 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNITII DESIGNANDCONSTRUCTIONTECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during SangamAge - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study(Madurai MeenakshiTemple)-Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNITIII MANUFACTURINGTECHNOLOGY 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting,steel -Copper and gold-Coinsassourceof history- Minting of Coins–Beadsmaking-industriesStone beads-Glassbeads
- Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

UNITIV AGRICULTUREANDIRRIGATIONTECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNITV SCIENTIFICTAMIL&TAMILCOMPUTING 3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Developmentof Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

TOTAL:15 PERIODS

TEXT-CUM-REFERENCEBOOKS

1. தமிழக வரலொறு– மக்களும் பண்பொடும்–கக·கக· பிள்ளள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும கல்வியியல் பணிகள் கழகம்). கணினித் தமிழ்– முளனவர் இல.சுந்தரம். (விகடன் பிரசுரம்). கீழடிளவளக நதிக் களரயில் சங்க கொல நகரநொகரிகம் (ததொல்லியல் Fளற தவளியீடு)
2. தபொருளந–ஆற்றங்களர நொகரிகம்.(ததொல்லியல்Fளற தவளியீடு)
3. SocialLifeofTamils(Dr.K.K.Pillay)AjointpublicationofTNTB&ESCandRMRL–(in print)
4. SocialLifeoftheTamils-TheClassicalPeriod(Dr.S.Singaravelu)(Publishedby: International Institute of Tamil Studies.
5. HistoricalHeritageoftheTamils(Dr.S.V.Subatamanian,Dr.K.D.Thirunavukkarasu) (Publishedby: International Institute of Tamil Studies).
6. TheContributionsoftheTamilstoIndianCulture(Dr.M.Valarmathi)(Publishedby: International Institute of Tamil Studies.)
7. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’(Jointly Published by: Department ofArchaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8. StudiesintheHistoryofIndiawithSpecialReferencetoTamilNadu(Dr.K.K.Pillay) (Published by: The Author)
9. Porunai Civilization(Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

GE3252 **தமிழரும் தொழிலநுட்பமும்** **L TP C**
1 001

அலகுI மநசவுமற்றும்பொறனத்மதொழில்நுட்பம்: **3**
சங்ககொலத்தில்தநசவுத்ததொழில்–பொளனத்ததொழில்நுட்பம் -கருப்பு சிவப்பு பொண்டங்கள்–பொண்டங்களில்கீறல்குறியீடுகள்.

அலகுIIவடிவறமப்பமற்றும்கட்டிடத்மதொழில்நுட்பம்: **3**
சங்ககொலத்தில்வடிவளமப்புமற்றும்கட்டுமொனங்கள்&சங்ககொலத்தில்வீட்டுப்தபொருட்களில்வடிவளமப்பு-சங்ககொலத்தில்கட்டுமொனதபொருட்களும்நடுகல்லும் – சிலப்பதிகொரத்தில்கமளடஅளமப்புபற்றியவிவரங்கள்-மொமல்லபுரச்சிற்பங்களும், ககொவில்களும்–கசொழர்கொலத்Fப்தபருங்ககொயில்கள்மற்றும்பிறவழிபொட்டுத்தலங்கள்–நொயக்கர்கொலக்ககொயில்கள்-மொதிரிகட்டளமப்புகள்பற்றிஅறிதல், மFளரமீனொட்சிஅம்மன்ஆலயம்மற்றும்திருமளலநொயக்கர்மஹொல்–தசட்டிநொட்டுவீடுகள்–பிரிட்டிஷ்கொலத்தில்தசன்ளனயில்இந்கதொ-சொகரொதசனிக்கட்டிடக்களல.

அலகுIIIஉற்பத்தித்மதொழில்நுட்பம்: **3**
கப்பல்கட்டும்களல– உகலொகவியல்– இரும்புத்ததொழிற்சொளல–இரும்ளபஉருக்குதல், எஃகு–வரலொற்றுச்சொன்றுகளொகதசம்புமற்றும்தங்கநொணயங்கள்–நொணயங்கள்அச்சடித்தல்–மணிஉருவொக்கும்ததொழிற்சொளலகள்–கல்மணிகள், கண்ணொடிமணிகள்– சுடுமண்மணிகள்– சங்குமணிகள்– எலும்புத்Fண்டுகள்–ததொல்லியல்சொன்றுகள்– சிலப்பதிகொரத்தில்மணிகளின்வளககள்.

அலகுIVகவளொை்றமமற்றும்நீர்ப்பொசனத்மதொழில்நுட்பம்: **3**
அளண,ஏரி,குளங்கள்,மதகு–கசொழர்கொலக்குமுழித்தூம்பின்முக்கியத்Fவம்–கொல்நளடபரொமரிப்பு–கொல்நளடகளுக்கொகவடிவளமக்கப்பட்டகிணறுகள்–கவளொண்ளமமற்றும்கவளொண்ளமச்சொர்ந்ததசயல்பொடுகள்– கடல்சொர்அறிவு–மீன்வளம்–முத்Fமற்றும்முத்Fக்குளித்தல்–தபருங்கடல்குறித்தபண்ளடயஅறிவு–அறிவுசொர்சமூகம்.

அலகுVஅறிவியல்தமிழ்மற்றும்ைகித்தமிழ்: **3**
அறிவியல்தமிழின்வளர்ச்சி–கணித்தமிழ்வளர்ச்சி-தமிழ்நூல்களளமின்பதிப்புதசய்தல்–தமிழ்தமன்தபொருட்கள்உருவொக்கம்–தமிழ்இளணயக்கல்விக்கழகம்– தமிழ்மின்நூலகம்–இளணயத்தில்தமிழ்அகரொதிகள்–தசொற்குளவத்திட்டம்.

TOTAL:15 PERIODS

TEXT-CUM-REFERENCEBOOKS

1. தமிழகவரலொறு–மக்களும்பண்பொடும்–கக.கக.பிள்ளள(தவளியீடு: தமிழ்நொடுபொடநூல்மற்றும்க ல்வியியல்பணிகள்கழகம்).
2. கணினித்தமிழ்–முளனவர்இல.சுந்தரம்.(விகடன்பிரசுரம்).
3. கீழடி– ளவளகநதிக்களரயில்சங்ககொலநகரநொகரிகம்(ததொல்லியல்Fளறதவளியீடு)
4. தபொருளந–ஆற்றங்களரநொகரிகம்.(ததொல்லியல்Fளறதவளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication ofTNTB & ESC and RMRL – (inprint)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Publishedby: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: DepartmentofArchaeology &Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Bookand Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

S24GE3271 ENGINEERING PRACTICES LABORATORY L T P C
0 0 4 2

COURSE OBJECTIVES:

The main learning objective of this course is to provide hands on training to the students in:

- Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
- Wiring various electrical joints in common household electrical wire work.
- Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
- Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & ELECTRICAL)

PART I CIVIL ENGINEERING PRACTICES 15

PLUMBING WORK:

a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.

b) Preparing plumbing line sketches.

c) Laying pipe connection to the suction side of a pump

d) Laying pipe connection to the delivery side of a pump.

e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:

a) Sawing,

b) Planing and

c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

Wood Work Study:

a) Studying joints in door panels and wooden furniture

b) Studying common industrial trusses using models.

PART II ELECTRICAL ENGINEERING PRACTICES 15

a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket

b) Staircase wiring

c) Fluorescent Lamp wiring with introduction to CFL and LED types.

d) Energy meter wiring and related calculations/ calibration

e) Study of Iron Box wiring and assembly

f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)

g) Study of emergency lamp wiring/Water heater

GROUP – B (MECHANICAL AND ELECTRONICS)

PART III MECHANICAL ENGINEERING PRACTICES 15

WELDING WORK:

a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.

b) Practicing gas welding.

BASIC MACHINING WORK:

a) (simple)Turning.

b) (simple)Drilling.

c) (simple)Tapping.

ASSEMBLY WORK:

a) Assembling a centrifugal pump.
b) Assembling a household mixer.
c) Assembling an airconditioner.

SHEET METAL WORK:
a) Making of a square tray
FOUNDRY WORK:
a) Demonstrating basic foundry operations.
PART IV ELECTRONIC ENGINEERING PRACTICES 15
SOLDERING WORK:
a) Soldering simple electronic circuits and checking continuity.
ELECTRONIC ASSEMBLY AND TESTING WORK:
a) Assembling and testing electronic components on a small PCB.
ELECTRONIC EQUIPMENT STUDY:
a) Study an elements of smart phone..
b) Assembly and dismantle of LED TV.
c) Assembly and dismantle of computer/ laptop

TOTAL: 60 PERIODS
COURSE OUTCOMES:
Upon completion of this course, the students will be able to:
CO1:Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
CO2:Wire various electrical joints in common household electrical wire work.
CO3:Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.
CO4:Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB

CO's-PO's & PSO's MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	-	-	-	1	-	1	-	-	-	-	-
2	3	3	2	2	-	-	-	1	-	1	-	-	-	-	-
3	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
4	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
5	3	3	3	2	-	-	-	1	-	1	-	-	-	-	-
CO	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**1**	-	**1**	**-**	**-**	**-**	**-**	**-**

1-low,2-medium,3-high,'-'-nocorrelation

S24ES3201 LEARNING BASIC C PROGRAMMING L T P C

0 0 2 1

COURSE OBJECTIVE:

- To familiarise with C programming constructs.
- To develop programs in C using basic constructs.
- To develop programs in C using arrays.
- To develop applications in C using strings, pointers, functions.
- To develop applications in C using structures.
- To develop applications in C using file processing.

LIST OF EXPERIMENTS

1) I/O statements, operators, expressions
2) decision-making constructs: if-else, goto, switch-case, break-continue
3) Loops: for, while, do-while
4) Arrays: 1D and 2D, multi-dimensional arrays, traversal
5) Strings: operations
6) Functions: call, return, passing parameters by (value, reference), passing arrays to function.
7) Recursion
8) Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers
9) Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions.
10) Files: reading and writing, File pointers, file operations, random access, processor directives.

COURSE OUTCOMES:

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

CO1:Use different constructs of C and develop applications
CO2:Write functions to implement linear and non-linear data structure operations.
CO4:Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval
CO5:Implement Sorting and searching algorithms for a given application.

CO's-PO's & PSO's MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	-	-	-	1	-	1	-	-	-	-	-
2	3	3	2	2	-	-	-	1	-	1	-	-	-	-	-
3	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
4	3	3	3	3	-	-	-	1	-	1	-	-	-	-	-
5	3	3	3	2	-	-	-	1	-	1	-	-	-	-	-
CO	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**1**	-	**1**	**-**	**-**	**-**	**-**	**-**

1-low,2-medium,3-high,'-'-nocorrelation

SEMESTER - III

S24AT351 ELECTROMAGNETICTHEORYANDINTERFERENCE

LTPC
3 1 0 4

COURSEOBJECTIVES:

- Toimpartknowledgeonthebasics ofvectoralgebratoanalyzeEM waves.
- Toimpartknowledgeonthebasicsofstatic electricfieldandtheassociatedlaws
- Togiveinsightintocouplingbetweenelectricandmagneticfieldsthrough Faraday'slaw,
- Acquirethefundamental knowledge onTransmissionLineTheoryandacquiretheknowledge onTransmission line parameter calculation and interference.
- Acquireknowledge on theoretical conceptsand analysistechniquesto find solutionsforproblemsRelated to electromagnetic wave propagation and Transmission line Theory

UNIT I INTRODUCTION 9

Electromagnetic model, Units and constants, Review of vector algebra, Rectangular, cylindrical and spherical coordinate systems, Line, surface and volume integrals, Gradient of a scalar field, Divergence of a vector field, Divergencetheorem,Curlofavectorfield,Stoke'stheorem,Nullidentities,Helmholtz'stheorem,Verifytheorems for different path, surface and volume.

UNITIIELECTROSTATICS 9

Electric field, Coulomb's law, Gauss'slawandapplications, Electric potential, Conductors instatic electric field, Dielectricsinstaticelectricfield,Electricfluxdensityanddielectricconstant,Boundaryconditions,Electrostatics boundary value problems, Capacitance, Parallel, cylindrical and spherical capacitors, Electrostatic energy, Poisson's and Laplace's equations, Uniqueness of electrostatic solutions, Current density and Ohm's law, Electromotive force and Kirchhoff's voltage law, Equation of continuity and Kirchhoff's current law

UNITIIIMAGNETOSTATICS 9

Lorentzforceequation,Ampere'slaw,Vectormagneticpotential,Biot-Savartlawandapplications,Magneticfield intensityandideaofrelativepermeability, Calculationofmagneticfieldintensityfor variouscurrentdistributions Magnetic circuits, Behaviour of magnetic materials, Boundary conditions, Inductance and inductors, Magnetic energy, Magnetic forces and torques

UNIT-IVELECTROMAGNETICWAVESANDWAVEGUIDES

Introduction to EM waves- Waves in general- Plane wave in lossless dielectric- Plane wave in free space- Plane wave in good conductor- Problems based on plane waves in lossless, free spaceand good conductor rectangular waveguide- rectangular waveguide-Problems.

UNIT-VTRANSMISSIONLINETHEORYANDINTERFENENCES,TRANSMISSIONLINECALCULATOR AND IMPEDANCE MATCHING

Transmission line parameters- Transmission line equivalent circuit- Explanation- Transmission line equation derivation-Problemdiscussion. -Transmissionlinecharacteristics:lossless Line-Distortionlessline-EMI/EMC-Types of EMI/EMC - SE, CE – Susceptibility

Introduction toimpedance matching- Smith chart Introduction- Reflection coefficient, Standing waveratio Input impedancecalculationinsmithchart-Practiceproblems.-SinglestubmatchingIntroduction-Procedurefor single stub matching- Problems solving in smith chart.

TOTALPERIODS:45

COURSEOUTCOMES

- Relatethefundamentalsofvector, coordinatesystemtoelectromagneticconcepts
- AnalyzethecharacteristicsofElectrostaticfield

- Interprettheconcepts ofElectricfieldinmaterialspaceandsolvetheboundaryconditions
- Describetheimportanceoftransmissionlinetheoryapplicabletolowfrequencytransmissionlines
- Solvetransmissionlineparameterandimpedancematchingthroughanalyticalandgraphicalmethods

TEXTBOOKANDREFERENCES

1. MatthewN.O.Sadiku.,S.V.Kulkarni, "ElementsofElectromagnetics", 6thed.,Oxford University Press, 2015
2. G.S.N.Raju,"ElectromagneticFieldTheoryandTransmissionLines", Pearson Education,2006
3. NannapaneniNarayanaRao,"PrinciplesofEngineeringElectromagnetics",6thed.Pearson Education, 2016
4. WilliamH.Hayt,Jr.,JohnA.Buck.,"EngineeringElectromagnetics",8thed.,TataMcGraw-Hill2012.
5. JohnD.Ryder,"Networks,LinesandFields",PHI,2009.

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	–	1	1	–	–	–	–	–	–	1	3	-	1
CO2	3	3	–	2	1	–	–	–	–	–	–	1	3	-	1
CO3	3	3	1	2	2	–	–	–	–	–	–	1	3	1	2
CO4	2	2	2	1	2	–	–	–	–	1	–	1	2	3	2
CO5	3	3	2	2	3	–	–	–	–	1	–	1	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

S24AT354 SIGNALPROCESSING LTPC

3104

- Understandthebasicconcepts,operationsandtypesofsignalsandsystems
- Analyzetheperiodicandaperiodiccontinuoussignalsusingfouriertransform andlaplace transform
- Analysethediscretetimesignalusingdftanddiscretetimesystemusingz-transform
- Designfirfilterusingwindowingtechnique
- Designanalogiirfilter,conversionofanalogfiltertodigitalfilter

Unit-1-ClassificationofSignalsandSystems 9

Introductiontosignalandsystems, Real timeApplications of Signals, Fundamental Signals-Unit impulse, Step,Rampvariousoperations onsignals-TimeShifting. Timereversal,TimeScaling, AmplitudeScaling, Signal Addition and Multiplication. Classification of Continuous and Discrete time signals- Periodic and Aperiodic, Even and Odd, Energy and Power, Deterministic and Random, Types of Systems- Linear and Nonlinear, Time Variant and invariant, Causal and Non-Causal, Static, and dynamic, Stable and unstable systems.

Unit-2-AnalysisofContinuousTime(CT)SignalsandSystems 9

Fourier Transform and Inverse Fourier Transform, Properties of Fourier Transform, Analysis of LTI CT system using Fourier Transform, Frequency Response, Impulse Response and Step response, Laplace TransformandInverseLaplaceTransform, RegionofConvergence(RoC)andProperties, Analysis ofLTI CT

system using Laplace Transform, Problems solving using properties of Laplace transform

Unit-3-AnalysisofDiscreteTime(DT)SignalsandSystems 9

Discrete Fourier Transform (DFT) and Inverse Discrete Fourier Transform (IDFT), Problems solving on DFT,FastFourier Transform(FFT) -DecimationinTimeFast Fourier Transform(DIT-FFT), Decimation in Frequency Fast Fourier Transform (DIF-FFT), Linear Convolution and Circular Convolution, Z-Transform, Region of Convergence (RoC) and Properties, Analysis of DT system using Z- transform, Stability of a system, Inverse Z Transform using Partial fraction method.

Unit-4-FiniteImpulseResponse(FIR)FilterDesign 9

Design of Linear Phase FIR Filters, Frequency Response of FIR Filter- N Odd (symmetric), Frequency Response of FIR Filter- N Even (Symmetric), FIR Filter Design using Windowing Technique, Design of FIRlowpass,Highpass,BandpassandBandStop filter Design-Rectangular Window, HanningWindow, Hamming Window and Blackman Window.

Unit-5 -InfiniteImpulseResponse(IIR)FilterDesign 9

IntroductiontoIIRFilters-ComparisonbetweenFIRandIIRFilters,AnalogIIRFilterdesign–Butterworth andChebyshevFilters, ComparisonofProperties ofButterworthandChebyshevFilters, DesignofIIRlow pass and High Pass filter using Butterworth method, Design of IIR low pass and High Pass filter using Chebyshev method, Conversion of Analog filter into Digital Filter- Bilinear Transformation and Impulse Invariance Method.

TOTALPERIODS:45

COURSEOBJECTIVES:

- SummarizetheClassificationofSignalsandSystemsandvariousoperationsonsignals
- ApplyFouriertransformandLaplacetransformonsolvingcontinuoustimesignalsandsystems
- ApplyDiscreteFourierTransformandZ-TransformonDiscretetimesignalsandsystems
- DesignFiniteImpulseResponseFiltersusingdifferenttypesofwindowingtechniques
- Design analog anddigitalInfiniteImpulseResponseFilters

TEXTBOOKSANDREFERNCES

1. AlanVOppenheim,RonaldW.Schafer,"Signals&Systems",2ndEdition,PrinticeHallof India,2015.
2. John G.Proakis,DimitrisG.Manolakis,"DigitalSignalProcessing:Principles,Algorithmsand Principles", 4th Edition, Printice Hall of India, 2001.
3. Alan V.Oppenheim,RonaldW.Schafer,JohnR.Buck.,"Discrete-Time Signal Processing",2nd Edition, Pearson, 2011.
4. B.P.LathiandRpgerGreen,"LinearSystemsandSignals",3rdEdition,OxfordUniversityPress, 2017

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	–	1	1	–	–	–	–	–	–	1	3	1	1
CO2	3	3	1	2	2	–	–	–	–	–	–	1	3	2	1
CO3	3	3	1	2	3	–	–	–	–	–	–	1	3	3	2
CO4	3	2	3	1	3	–	–	–	–	1	–	1	2	3	3
CO5	3	3	3	2	3	–	–	–	–	1	–	1	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

S24AT353 LINEARINTEGRATEDCIRCUITS

LTPC
3 0 0 3

COURSEOBJECTIVES:

1. Tointroducethebasicbuildingblocksoflinearintegratedcircuits
2. Tolearnthelinearandnon-linearapplicationsofoperationalamplifiers
3. Tointroducethetheoryandapplicationsofanalogmultipliersand PLL
4. TolearnthetheoryofADCandDAC
5. Tointroducetheconceptsofwaveformgenerationandintroducesomespecialfunction ICs

UNITIBASICSOFOPERATIONALAMPLIFIERS 9

Current mirror and current sources, Current sources as active loads, Voltage sources, Voltage References,BJTDifferentialamplifierwithactiveloads,Basicinformationaboutop-amps–Ideal OperationalAmplifier -Generaloperationalamplifier stages -andinternalcircuitdiagrams ofIC 741, DC and AC performance characteristics, slew rate, Open and closed loop configurations – MOSFET Operational Amplifiers – LF155 and TL082.

UNITIIAPPLICATIONSOFOPERATIONALAMPLIFIERS 9

Sign Changer, Scale Changer, Phase Shift Circuits, Voltage Follower, V-to-I and I-to-V converters, adder, subtractor, Instrumentation amplifier, Integrator, Differentiator, Logarithmic amplifier, Antilogarithmic amplifier, Comparators, Schmitt trigger, Precision rectifier, peak detector, clipper and clamper, Low-pass, high-pass and band-pass Butterworth filters.

UNITIIIANALOGMULTIPLIERANDPLL 9

Analog Multiplier using Emitter Coupled Transistor Pair - Gilbert Multiplier cell – Variable transconductance technique, analog multiplier ICs and their applications, Operation of the basic PLL, Closed loop analysis, Voltagecontrolled oscillator, Monolithic PLL IC 565, applicationof PLL for AM detection, FM detection, FSK modulation and demodulation and Frequency synthesizing and clock synchronization

UNITIVANALOGTODIGITALANDDIGITALTOANALOGCONVERTERS 9

AnalogandDigitalDataConversions, D/Aconverter –specifications-weightedresistor type, R- 2R Ladder type, Voltage Mode and Current-Mode *R - 2R* Ladder types - switches for D/A converters, high speed sample-and-hold circuits, A/D Converters – specifications - Flash type - Successive Approximation type - Single Slope type – Dual Slope type - A/D Converter using Voltage-to-Time Conversion - Over-sampling A/D Converters, Sigma – Delta converters.

UNITVWAVEFORMGENERATORSANDSPECIALFUNCTION ICS 9

Sine-wavegenerators, MultivibratorsandTriangular wavegenerator, Saw-toothwavegenerator, ICL8038 function generator, Timer IC 555, IC Voltage regulators – Three terminal fixed and adjustablevoltageregulators-IC723generalpurposeregulator-Monolithicswitchingregulator, Low Drop – Out(LDO) Regulators - Switched capacitor filter IC MF10, Frequency to Voltage and Voltage to Frequency converters, Audio Power amplifier, Video Amplifier, Isolation Amplifier, Opto- couplers and fibre optic IC

TOTAL:45PERIODS

COURSEOUTCOMES:

Attheendofthecoursethestudentswillbeableto

CO1:DesignlinearandnonlinearapplicationsofOP–AMPS **CO2** : Design applications using analog multiplier and PLL **CO3** : Design ADC and DAC using OP – AMPS

CO4:GeneratewaveformsusingOP–AMPCircuits

CO5:AnalyzespecialfunctionICs

TEXTBOOK

- 1.D.RoyChoudhry,ShailJain,"LinearIntegratedCircuits",NewAgeInternationalPvt.Ltd., 2018, Fifth Edition. (Unit I – V)
- 2.SergioFranco,"DesignwithOperationalAmplifiersandAnalogIntegratedCircuits",4th Edition, Tata Mc Graw-Hill, 2016 (Unit I – V)

REFERENCES

1. RamakantA.Gayakwad,"OP-AMPandLinearICs",4thEdition,PrenticeHall/Pearson Education, 2015
2. RobertF.Coughlin,Frederick F.Driscoll,"OperationalAmplifiersand LinearIntegrated Circuits", Sixth Edition, PHI, 2001.
3. S.Salivahanan&V.S.KanchanaBhaskaran,"LinearIntegratedCircuits",TMH,2ndEdition, 4th Reprint, 2016.

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	–	–	–	–	1	–	1	3	2	3
CO2	3	2	3	2	3	–	–	–	–	1	–	1	3	2	3
CO3	3	2	3	2	3	–	–	–	–	1	–	1	3	2	3
CO4	3	–	3	1	3	–	–	–	–	1	–	1	3	2	3
CO5	3	3	2	2	3	–	–	–	–	1	–	1	3	2	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

S24AT352

ANTENNAANDWAVEPROPAGATION **LTPC 3003**

OBJECTIVES:

1. Togiveinsightoftheradiationphenomena.
2. Togiveathoroughunderstandingoftheradiationcharacteristicsofdifferenttypesofantennas.
3. Tocreateawarenessaboutthedifferenttypesofpropagationofradiowavesatdifferent frequencies.

UNITIFUNDAMENTALSOFRADIATION **9** Definition of antenna parameters – Gain, Directivity, Effective aperture, Radiation Resistance, Band width, Beam width,InputImpedance.Matching–Baluns,Polarizationmismatch,Antennanoisetemperature,Radiation from oscillating dipole, Half wave dipole. Folded dipole, Yagi array.

UNITIIAPERTUREANDSLOTANTENNAS **9**

Radiation fromrectangular apertures, Uniformand Tapered aperture, Horn antenna , Reflector antenna , Aperture blockage , Feeding structures , Slot antennas ,Microstrip antennas – Radiation mechanism – Application ,Numerical tool for antenna analysis

UNITIIIANTENNAARRAYS **9**

Element linear array, Pattern multiplication, Broadside and End fire array – Concept of Phased arrays, Adaptive array, Basic principle of antenna Synthesis-Binomial array

UNITIVSPECIAL ANTENNAS **9**

Principle of frequency independent antennas –Spiral antenna, Helical antenna, Log periodic. Modern antennas-Reconfigurableantenna, Activeantenna, Dielectricantennas, Electronicbandgapstructureand applications,AntennaMeasurements-TestRanges,MeasurementofGain,Radiationpattern,Polarization, VSWR 66

UNITVPROPAGATIONOF RADIOWAVES **9**

Modes of propagation, Structureof atmosphere, Ground wavepropagation, Tropospheric propagation , Duct propagation, Troposcatter propagation , Flat earth andCurved earth concept Sky wavepropagation – Virtual height, critical frequency , Maximum usable frequency – Skip distance, Fading , Multi hop propagation

TOTAL:45PERIODS

OUTCOMES:

Uponcompletionofthecourse,studentswillbeableto:

1. Explainthevarioustypesofantennasandwavepropagation.
2. Writeabouttheradiationfromacurrentelement.
3. Analyzetheantennaarrays,apertureantennasandspecialantennassuchasfrequencyindependent and broad band

TEXTBOOK:

2. JohnDKraus,"AntennasforallApplications",3rdEdition,McGrawHill,2005.

REFERENCES:

- Edward C.Jordan and Keith G.Balmain" Electromagnetic Waves and Radiating Systems" Prentice Hall of India, 2006
- R.E.Collin,"AntennasandRadiowavePropagation",McGrawHill1985.
- Constantine.A.Balanis"AntennaTheoryAnalysisandDesign",WileyStudentEdition,2006.
- RajeswariChatterjee,"AntennaTheoryandPractice"RevisedSecondEditionNewAgeInternational Publishers, 2006.
- S.Drabowitch, "ModernAntennas"SecondEdition,SpringerPublications,2007.
- RobertS.Elliott"AntennaTheoryandDesign"WileyStudentEdition,2006.
- H.Sizun"RadioWave PropagationforTelecommunicationApplications",FirstIndianReprint,

Springer Publications, 2007.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	–	1	–	–	–	–	–	–	–	2	3	1	1
CO2	3	2	–	1	–	–	–	–	–	–	–	2	3	2	1
CO3	3	3	1	2	1	–	–	–	–	1	–	2	3	3	2
CO4	3	2	1	2	2	–	–	–	–	1	–	2	2	3	3
CO5	3	2	–	1	–	–	1	–	–	–	–	3	2	3	1

CO's & PSO's MAPPING

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24ACT361 LINEARINTEGRATED CIRCUITSLABORATORY

L T P C
0032

COURSEOBJECTIVES:

1. Togainhandsonexperienceindesigningelectroniccircuits
2. Tolearnsimulationsoftwareusedincircuit design
3. Tolearnthefundamentalprinciplesofamplifiercircuits
4. Todifferentiatefeedbackamplifiersandoscillators.
5. Todifferentiatetheoperationofvariousmultivibrators

LISTOFEXPERIMENTS:

DESIGNAND ANALYSISOFTHEFOLLOWINGCIRCUITS

5. SeriesandShuntfeedbackamplifiers-Frequencyresponse,Inputandoutputimpedance
6. RCPhaseshiftoscillatorandWienBridgeOscillator
7. HartleyOscillatorandColpittsOscillator
8. RCIntegratorandDifferentiatorcircuitsusingOp-Amp
9. ClippersandClampers
10. Instrumentationamplifier
11. Activelow-pass,Highpass&Bandpassfilters
12. PLLCharacteristicsanditsuseasfrequencymultiplier,clocksynchronization
13. R-2RladdertypeD-AconverterusingOp-Amp

SIMULATIONUSINGSPICE(UsingTransistor):

1. TunedCollectorOscillator
2. Twin-TOscillator/WeinBridgeOscillator
3. DoubleandStaggertunedAmplifiers
4. BistableMultivibrator
5. SchmittTriggercircuitwithPredictablehysteresis
6. Analysisofpoweramplifier

COURSEOUTCOMES:

Attheendofthecoursethestudentswillbeableto

CO1:Analyzevarioustypesoffeedbackamplifiers

CO2:Designoscillators,tunedamplifiers,wave-shapingcircuitsandmultivibrators

CO3:Designandsimulatefeedbackamplifiers,oscillators,tunedamplifiers,wave-shapingcircuitsand multivibrators, filters using SPICE Tool.

CO4:Designamplifiers,oscillators,D-Aconvertersusingoperationalamplifiers.

CO5:Designfiltersusingop-ampandperformanexperimentonfrequencyresponse

CO's-PO's & PSO's MAPPING

CO →	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	2	1	–	–	–	1	2	–	1	3	2	1
CO 2	3	2	3	2	2	–	–	–	1	2	–	1	3	3	2
CO 3	3	2	3	3	3	–	–	–	1	2	–	1	3	3	3
CO 4	3	2	3	2	2	–	–	–	1	2	–	1	3	3	2
CO 5	3	1	2	2	2	–	–	–	1	2	–	1	3	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation's

IV SEMESTER

S24AT451 MICROPROCESSOR, MICROCONTROLLER AND INTERFACING

LTPC

3003

CourseObjectives:

1. TounderstandtheArchitectureof8086 microprocessor.
2. TolearnthedesignaspectsofI/OandMemoryInterfacingcircuits.
3. Tointerface microprocessorswithsupportingchips.
4. TostudytheArchitectureof8051microcontroller.
5. Todesignamicrocontrollerbasedsystem

CourseOutcomes: Uponcompletingthiscourse,thestudentableto

6. 8-bitmicrocontrollers,learnassemblyandC-programmingofPIC.
7. LearnInterfacingofMicrocontroller.
8. LearnerswillstudyaboutPICmicrocontrollerandsystemdesign.

9. Thecoursewouldenablestudentstoenrichtheir knowledgewithhandsonexperimentsandproject based learning

UNITITHE8086MICROPROCESSOR

Introductionto8086—Microprocessorarchitecture—Addressingmodes—Instructionsetandassembler directives — Assembly language programming — Modular Programming — Linking and Relocation — Stacks — Procedures — Macros — Interrupts and interrupt service routines — Byte and String Manipulation.

UNITII8086SYSTEMBUSSTRUCTURE

8086signals—Basicconfigurations—Systembustiming–Systemdesignusing8086—I/Oprogramming — Introduction to Multiprogramming — System Bus Structure — Multiprocessor configurations — Coprocessor, CloselycoupledandlooselyCoupledconfigurations —Introductiontoadvancedprocessors.

UNIT III I/O INTERFACING

Memory Interfacing and I/O interfacing — Parallel communication interface — Serial communication interface — D/A and A/D Interface — Timer — Keyboard /display controller — Interrupt controller — DMAcontroller —Programmingandapplications Casestudies:TrafficLight control, LEDdisplay, LCD display, Keyboard display interface and Alarm Controller.

UNITIVMICROCONTROLLER

Architecture of 8051 — Special Function Registers (SFRs) — I/O Pins Ports and Circuits — Instruction set — Addressing modes — Assembly language programming.

UNITVINTERFACINGMICROCONTROLLER

Programming8051Timers —SerialPortProgramming —InterruptsProgramming—LCD&Keyboard Interfacing—ADC,DAC&SensorInterfacing—ExternalMemoryInterface-StepperMotorand Waveform generation — Comparison of Microprocessor, Microcontroller, PIC and ARM processors

TEXT BOOKS:

- MuhammadAliMazidi,SarmadNaimi,SepehrNaimi'AVRMicrocontroller andEmbeddedSystems using Assembly and C", Pearson Education 2014.

- MicroprocessorArchitecture,Programming,andApplicationswiththe8085(4thEdition)
- MicroprocessorsandInterfacing:ProgrammingandHardware(Hardcover)DouglasV.Hall.
- 8086MicroprocessorBharatAcharyaEducation:ArchitectureandInterfacing(2017Book1)

REFERENCEBOOKS:

1. DoughlasV.Hall,—MicroprocessorsandInterfacing,ProgrammingandHardware‖,TMH,2012

2. A.K.Ray,K.M.Bhurchandi,"AdvancedMicroprocessorsandPeripherals"3rdedition,Tata McGrawHill, 2012

CO → PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	1	–	–	–	1	2	–	1	3	2	1
CO2	3	3	3	2	2	–	–	–	1	2	–	1	3	3	2
CO3	3	2	3	3	3	–	–	–	1	2	–	1	3	3	3
CO4	3	2	2	2	1	–	–	–	1	2	–	1	3	3	2
CO5	3	2	3	2	2	–	–	–	1	2	–	2	3	3	3

& PSO's MAPPING

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24AT452

WIRELESSCOMMUNICATIONANDNETWORKS **LTPC 3 0 03**

COURSEOBJECTIVES:

- Tostudyandunderstandtheconceptsanddesignofa CellularSystem.
- ToStudyAndUnderstandMobileRadioPropagationAndVariousDigitalModulationTechniques.
- ToUnderstandTheConceptsOfMultipleAccessTechniquesAndWirelessNetworks
- TounderstandtheconceptaboutWirelessnetworks,protocolstackandstandards
- TounderstandandanalysesthenetworklayersolutionsforWirelessnetworks

UNIT-ITHECELLULARCONCEPT-SYSTEMDESIGNFUNDAMENTALS 9

Introduction-Frequency Reuse-Channel Assignment Strategies-Handoff Strategies: Prioritizing Handoffs, Practical Handoff Considerations. Interference And System Capacity: Co-Channel Interference And SystemCapacity-ChannelPlanningFor Wireless Systems, Adjacent Channel Interference, Power Control ForReducingInterference,TrunkingAndGradeOfService.ImprovingCoverageAndCapacityInCellular Systems: Cell Splitting, Sectoring.

UNIT-II MOBILERADIOPROPAGATION 9

LargeScalePath Loss: IntroductionTo RadioWavePropagation -FreeSpacePropagationModel –Three Basic Propagation Mechanism: Reflection – Brewster Angle- Diffraction- Scattering.Small Scale Fading AndMultipath:SmallScaleMultipathPropagation,FactorsInfluencingSmall-ScaleFading,DopplerShift, Coherence Bandwidth, Doppler Spread And Coherence Time. Types Of Small- Scale Fading: Fading Effects Due To Multipath Time Delay Spread, Fading Effects Due To Doppler Spread.

UNIT-IIIMODULATIONTECHNIQUESANDEQUALIZATIONANDDIVERSITY 9

Digital Modulation – An Overview: Factors That Influence The Choice Of Digital Modulation, Linear Modulation Techniques: Minimum Shift Keying (MSK), Gaussian Minimum Shift Keying (GMSK), Spread Spectrum Modulation Techniques: Pseudo- Noise (PN) Sequences, Direct Sequence Spread Spectrum (DS-SS)- Modulation Performance In Fading And Multipath.

UNITIVWIRELESSLAN 9

Introduction-WLANtechnologies:-IEEE802.11:Systemarchitecture,protocolarchitecture,802.11b, 802.11a –HiperLAN:WATM,BRAN,HiperLAN2–Bluetooth:Architecture,WPAN–IEEE802.15.4, Wireless USB, Zigbee, 6LoWPAN, WirelessHART

UNITVMOBILENETWORKLAYER 9

Introduction-MobileIP:IPpacketdelivery,Agent discovery,tunnelingandencapsulation,IPV6-Network layer in the internet- Mobile IP session initiation protocol - mobile ad-hoc network: Routing: Destination Sequence distance vector, IoT: CoAP

TOTALPEROID:45

COURSEOUTCOMES:

Uponsuccessfulcompletionofthecoursethestudentwillbeableto: CO1:
Understand The Concept And Design Of A Cellular System.
CO2:UnderstandMobileRadioPropagationAndVariousDigitalModulationTechniques.
CO3: Understand the Concepts of Multiple Access Techniques and Wireless Networks
CO4: Conversant with the latest 3G/4G networks and its architecture
CO5:Designandimplementwirelessnetworkenvironmentforanyapplicationusinglatest wireless protocols and standards

TEXTBOOKANDREFERENCES

1. Rappaport,T.S.,-Wirelesscommunications",PearsonEducation, SecondEdition,2010.
2. WirelessCommunication–AndreaGoldsmith,CambridgeUniversityPress,2011
3. VanNee,R.andRamjiPrasad,—OFDMforwirelessmultimediacommunications,ArtechHouse,2000
4. DavidTseandPramodViswanath,—FundamentalsofWirelessCommunication,CambridgeUniversity Press, 2005.
5JochenSchiller,"MobileCommunications",SecondEdition,PearsonEducation 2012.(Unit I,II,III)
6.VijayGarg,"WirelessCommunicationsandnetworking",FirstEdition,Elsevier2007.(Unit IV, V)

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	–	–	–	–	1	–	1	2	3	1
CO2	3	3	2	2	2	–	–	–	1	1	–	2	3	2	2
CO3	2	2	2	1	2	–	–	–	–	1	–	1	2	3	2
CO4	3	2	2	2	3	–	–	–	1	2	1	2	2	3	2
CO5	3	3	3	2	3	–	–	–	2	2	2	3	2	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24AT453

ANALOGANDDIGITALCOMMUNICATION **LTPC 3 0 0 3**

UNITIANALOGMODULATION **9**

ReviewofFourier andHilbertTransforms-AmplitudeModulation–AM,DSBSC,SSBSC,VSB–Spectral analysisof modulatedsignal, Anglemodulationanddemodulation:Narrowband, WidebandFM -Spectral analysis of modulated signal,

UNITIIDIGITALBASEBANDMODULATION **9**

Schematic of digital communication systems, Sampling - Quantization – Uniform and non-uniform quantization – Quantization noise– Speech Coders: Companding laws of speech signals, PCM, DPCM, ADPCM, DM, and ADM.

UNITIIISOURCECODINGANDCHANNELCODING **9**

Measure of information – Entropy – Source Coding: Source coding theorem, Shannon-Fano coding, Huffman Coding - Channel Coding: Shannon-Hartley law, Linear block codes, Cyclic codes, syndrome decoding, Convolutional codes, Viterbi decoding

UNITIVBASEBANDSIGNALING **9**

Line codes: RZ, NRZ, Manchester, Binary N-zero substitution codes - PSDs, ISI, Pulse shaping, Eye diagram

UNITVBANDPASSSIGNALING **9**

Generation and detection of coherent schemes: BPSK, BFSK, QPSK- BER and Power Spectral Density Comparison- Generation and detection of non-coherent schemes: BFSK, DPSK, Overview of QAM, And MSK

TOTALPEROID:45

COURSEOUTCOMES:

Attheendofthecourse, studentswill have

CO1: Ability to develop communication system using analog modulation techniques

CO2: Abilitytodevelopcommunicationsystemsusingdigitalvoicecodingtechniques

CO3: Abilitytoexploretheroleofsourceandchannelcoders indigitalcommunication **CO4:** Ability to analyze Pulse modulation schemes

CO5: AbilitytounderstandbasicsofInformationTheoryandsomecodingschemes

TEXTBOOKS:

1. S.Haykin,"CommunicationSystems",JohnWiley,4thEdition,2007.

2. J.G.Proakis,M.Salehi,"FundamentalsofCommunicationSystems",PearsonEducation2006**.**

REFERENCE BOOKS:

• HPHsu,SchaumOutlineSeries,"AnalogandDigitalCommunications",TMH2006

• B.P.Lathi,"ModernDigitalandAnalogCommunicationSystems",OxfordUniversityPress,3rdEdition, 2007.

• B.Sklar,"Digital CommunicationsFundamentalsand Applications",PearsonEducation2ndEdition, 2007.

• D.Roody,J.Coolen,"ElectronicCommunications",PHI, 4thEdition,2006.

• V.ChandraSekar,"AnalogCommunication",OxfordUniversityPress,2012.

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	–	–	–	–	1	–	1	3	3	2
CO2	3	2	3	2	2	–	–	–	–	1	–	1	3	3	2
CO3	3	3	2	2	2	–	–	–	–	1	–	2	3	3	2
CO4	3	3	2	3	2	–	–	–	–	1	–	2	3	2	2

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO5	3	2	2	2	1	–	–	–	–	1	–	3	3	3	1

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24AT454VLSIANDDESIGNTECHNOLOGY

LTPC
3003

COURSEOBJECTIVES:

- UnderstandthefundamentalsofICtechnologycomponentsandtheir characteristics.
- Understand combinationallogiccircuitsanddesignprinciples.
- Understandsequentiallogiccircuitsandclockingstrategies.
- UnderstandASICDesignfunctioninganddesign.
- UnderstandMemoryArchitectureandbuildingblocks

UNITI
MOS TRANSISTORPRINCIPLES

MOS logic families (NMOS and CMOS), Ideal and Non Ideal IV Characteristics, CMOS devices. MOS(FET) Transistor Characteristic under Static and Dynamic Conditions, Technology Scaling, power consumption

UNITII

COMBINATIONALLOGICCIRCUITS

Propagation Delays, stick diagram, Layout diagrams, Examples of combinational logic design, Elmore's constant,StaticLogicGates,DynamicLogicGates,PassTransistor Logic,Power Dissipation, LowPower Design principles.

UNITIII

SEQUENTIALLOGICCIRCUITSANDCLOCKINGSTRATEGIES

Static Latches and Registers, Dynamic Latches and Registers, Pipelines, Nonbistable Sequential Circuits. Timing classification of Digital Systems, Synchronous Design, Self-Timed Circuit Design.

UNITIV

INTERCONNECT,MEMORYARCHITECTUREANDARITHMETICCIRCUITS

Interconnect Parameters – Capacitance, Resistance, and Inductance, Electrical WireModels, Sequential digitalcircuits:adders,multipliers,comparators,shiftregisters.LogicImplementationusingProgrammable Devices (ROM, PLA, FPGA), Memory Architecture and Building Blocks, Memory Core and Memory Peripherals Circuitry

UNITV

ASICDESIGNANDTESTING

Introduction to wafer to chip fabrication process flow. Microchip design process & issues in test and verificationofcomplex chips, embeddedcores andSOCs,Fault models, Test coding. ASIC DesignFlow, Introduction toASICs, Introduction totest benches, Writing test benches in VerilogHDL, Automatic test pattern generation, Design for testability, Scan design: Test interface and boundary scan.

TOTAL: 45 PERIODS

COURSEOUTCOMES:

Uponsuccessfulcompletionofthecoursethestudent willbeableto CO1:
In depth knowledge of MOS technology
CO2:UnderstandCombinationalLogicCircuitsandDesignPrinciples
CO3: Understand Sequential Logic Circuits and Clocking Strategies
CO4: Understand Memory architecture and building blocks
CO5:UnderstandtheASICDesignProcessandTesting.

TEXTBOOKS

1.JanDRabaey,AnanthaChandrakasan,"DigitalIntegratedCircuits:A DesignPerspective",PHI, 2016.(Units II, III and IV).
2.NeilHEWeste,KamranEshranghian,"PrinciplesofCMOSVLSIDesign:ASystemPerspective," Addison Wesley, 2009. (Units - I, IV).
3.MichaelJSmith,"ApplicationSpecificIntegratedCircuits,AddisonWesley,(Unit-V)
SamirPalnitkar,"VerilogHDL:AguidetoDigitalDesignandSynthesis",SecondEdition,Pearson Education,2003.(Unit-V)
3. ParagK.Lala,"DigitalCircuitTestingandTestability",AcademicPress,1997,(Unit-V)

REFERENCES

1.D.A.HodgesandH.G.Jackson,AnalysisandDesignofDigitalIntegratedCircuits,InternationalStudent Edition, McGraw Hill 1983
2.P.Rashinkar,PatersonandL.Singh,"System-on-a-ChipVerification-MethodologyandTechniques", KluwerAcademicPublishers,2001
3.SamihaMouradandYervantZorian,"PrinciplesofTestingElectronicSystems",Wiley2000

4.M.BushnellandV.D.Agarwal,"EssentialsofElectronicTestingforDigital,MemoryandMixed-

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	1	1	1	1	2	2	2	3	2	1
CO2	3	3	3	2	2	1	1	1	1	2	2	2	3	3	1
CO3	3	3	3	2	2	1	1	1	1	2	2	2	3	3	2
CO4	3	2	3	2	3	1	1	1	1	2	2	2	3	3	2
CO5	3	3	3	3	3	1	1	1	2	3	3	3	2	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24AT455COMPUTERARCHITECTUREAND ORGANIZATION

LTPC
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UNITICOMPUTINGANDCOMPUTERS 9

Evolution of Computers, VLSI Era, buses, bus control, bus interfacing, bus arbitration, System Design methodology:Gatelevel,RegisterLevel,ProcessorLevel,CPUOrganization,DataRepresentation,Fixed Point Numbers, Floating Point Numbers.

UNITIIDATAPATHDESIGN 9

Fixed Point Arithmetic, Addition, Subtraction, Multiplication and Division, Combinational and Sequential ALUs, Carry look ahead adder, Robertson algorithm, Booth's algorithm, Modified booth's Algorithm, Restoring and non- restoring division algorithm, Floating Point Arithmetic, Coprocessor.

UNIT IIICONTROLDESIGNANDPIPELINING DESIGN 9

Hardwired Control, Micro programmed Control, Multiplier Control Unit, CPU Control Unit, Pipeline Techniques- Linear pipeline processors, non- linear pipeline processors, Instruction pipeline design, Pipeline Performance, Arithmeticpipeline design.

UNITIVMEMORYORGANIZATION 9

Memoryhierarchytechnology,Memorytypes-RAM,ROM,MOS-staticanddynamicRAMcell,Virtual Memory: Address translation-TLB-page operation-Demand paging, Multicore architecture, Cache memorysystem-Mappingfunction, Cachewrite/updating, Cachecoherence, Performancecharacteristics of two level memories.

UNITV RISCANDCISCPROCESSORS 9

Characteristics of RISC and CISC – RISC example -MIPS RX00- architecture- Instruction format, instruction set, programming. CISC example- Motorola 680X0-Architecture, Instruction format, instruction set, programming. Superscalar processors, vector processors, nano programming.

OTAL PERIOD:45

COURSEOUTCOME S:

Attheendofthecourse,studentswillhave
CO1:Abilitytoacquirefundamentalknowledgeincomputerarchitectureandorganization.
CO2:Ability to design data path for arithmetic algorithms
CO3:Ability to analyze control unit design and pipelining concepts
CO4:Abilitytounderstandcache andvirtual memorycharacteristics.
CO5:Ability to differentiate RICS and CISC architectures.

TEXTBOOKS:

1. JohnP.Hayes,"ComputerarchitectureandOrganisation",TataMcGraw-Hill,Third edition,1998.
2. V.CarlHamacher,ZvonkoG.VaranesicandSafatG.Zaky,"Computer Organisation", V edition, McGraw-Hill Inc., 1996.
3. KaiHwang,NareshJotwani,"AdvancedcomputerArchitecture",Parallelism,Scalability, Programmability, Tata McGraw Hill, 3rd Edition, 1993.

REFERENCEBOOKS:

- MorrisMano,"ComputerSystemArchitecture",Prentice-HallofIndia,2000.
- BehroozParaami,"ComputerArchitecture,FromMicroprocessortoSupercomputers",Oxford University Press, Sixth impression 2010.
- P.PalChaudhuri,"Computerorganizationanddesign",2ndEd.,PrenticeHallofIndia,2007.
- MilesJ.MurdoccaandVincentP.Heuring,"PrinciplesofComputerArchitecture",Prentice Hall, 2000
- WilliamStallings,"ComputerOrganisationandArchitecture,Designingfor Performance", Pearson Education, Eighth Edition 2010.

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	1	1	1	1	2	2	2	3	2	1
CO2	3	3	3	2	2	1	1	1	1	2	2	2	3	3	2
CO3	3	3	3	2	2	1	1	1	1	2	2	3	3	3	2
CO4	3	2	2	2	3	1	1	1	1	2	2	2	2	3	2
CO5	3	3	2	2	1	1	1	1	1	2	2	3	2	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation's

HUMANVALUESANDETHICS

LTPC 3
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COURSEOBJECTIVES:

- To create awareness about values and ethics enshrined in the Constitution of India
- To sensitize students about the democratic values to be upheld in the modern society.
- To inculcate respect for all people irrespectiveoftheirreligionorotheraffiliations.
- To instill the scientific temper in the students' minds and develop their critical thinking.
- To promote sense of responsibility and understanding of the duties of citizen.

UNITIDEMOCRATICVALUES **9**

Understanding Democratic values: Equality, Liberty, Fraternity, Freedom, Justice, Pluralism, Tolerance, RespectforAll,FreedomofExpression,CitizenParticipationinGovernance–WorldDemocracies:French Revolution,AmericanIndependence,IndianFreedomMovement. ReadingText:ExcerptsfromJohnStuart Mills' *On Liberty*

UNITIISECULARVALUES **9**

UnderstandingSecularvalues –InterpretationofsecularisminIndiancontext -Disassociationofstatefrom religion–Acceptanceofallfaiths–Encouragingnon-discriminatorypractices.ReadingText:Excerptfrom *Secularism in India: Concept and Practice* by Ram Puniyani

UNITIIISCIENTIFICVALUES **9**

Scientific thinking and method: Inductive and Deductive thinking, Proposing and testing Hypothesis, Validatingfacts usingevidencebasedapproach – SkepticismandEmpiricism– RationalismandScientific Temper.Reading Text: Excerpt from *The Scientific Temper* by Antony Michaelis R

UNITIVSOCIALETHICS **9**

Application of ethical reasoning to social problems – Gender bias and issues – Gender violence – Social discrimination – Constitutional protection and policies – Inclusive practices.

UNITVSCIENTIFICETHICS **9**

TransparencyandFairnessinscientificpursuits–Scientificinventionsforthebettermentofsociety-Unfair application of scientific inventions – Role and Responsibility of Scientist in the modern society.

TOTAL:45PERIODS

COURSEOUTCOMES

Studentswillbeableto

CO1:Identifytheimportanceofdemocratic,secularandscientificvaluesinharmoniousfunctioningof social life

CO2:Practicedemocraticandscientificvaluesinboththeirpersonalandprofessionallife. CO3:

Find rational solutions to social problems.

CO4:Behaveinanethicalmannerinsociety

CO5:Practicecriticalthinkingandthepursuit oftruth.

REFERENCES:

1. TheNonreligious:UnderstandingSecularPeopleandSocieties,LukeW.GalenOxfordUniversityPress, 2016.
2. Secularism:ADictionaryofAtheism,Bullivant,Stephen;Lee,Lois,OxfordUniversityPress,2016.
3. TheOxfordHandbookofSecularism,JohnR.Shook,OxfordUniversityPress,2017.
4. TheCivicCulture:PoliticalAttitudesandDemocracyinFiveNationsbyGabrielA.AlmondandSidney Verba, Princeton University Press,
5. ResearchMethodologyforNaturalSciencesbySoumitroBanerjee,IIScPress,January2022

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
CO1	1	1	1	1	1	**3**	**3**	**3**	2	2	2	2	3	3	2
CO2	1	1	1	2	1	**3**	**3**	**3**	2	2	2	2	3	2	3
CO3	1	2	2	**3**	1	**3**	**3**	**3**	2	2	2	**3**	2	3	3
CO4	1	1	1	1	1	**3**	**3**	**3**	2	**3**	2	2	3	3	2
CO5	1	**3**	2	**3**	1	2	2	2	2	2	2	**3**	2	2	3

1 - low, 2 - medium, 3 - high, '-' - no correlation's

S24AT461MICROPROCESSOR, MICROCONTROLLER AND INTERFACING LABORATORY

LTPC
0031

OBJECTIVES

- ToIntroduceALP concepts, features andCoding methods
- WriteALPforarithmeticandlogicaloperationsin8086and8051
- Differentiate Serial and Parallel Interface
- InterfacedifferentI/OwithMicroprocessors
- Be familiar with MASM

LISTOFEXPERIMENTS

8086PROGRAMSUSINGKITS

1. BasicarithmeticandLogicaloperations
2. Moveadatablockwithoutoverlap
3. Codeconversion,decimalarithmeticandMatrixoperations.
4. Floatingpointoperations,stringmanipulations,sortingandsearching

PERIPHERALSANDINTERFACINGEXPERIMENTS

5. Trafficlightcontroller
6. Steppermotorcontrol
7. KeyboardandDisplay
8. Printerstatus

10.A/DandD/AinterfaceandWaveformGeneration

8051EXPERIMENTSUSINGKITS

1. BasicarithmeticandLogicaloperations
2. SquareandCubeprogram,Find2'scomplementofanumber
3. UnpackedBCDtoASCII

OUTCOMES:

Attheendofthecourse, thestudentshouldbeableto:

- WriteALPProgrammesforfixedandFloatingPointandArithmeticoperations
- Interface different I/Os with processor
- GeneratewaveformsusingMicroprocessors
- Execute Programs in 8051
- Explainthedifferencebetweensimulator andEmulator

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**3**	**3**	2	2	1	1	1	1	2	1	2	3	2	2
CO2	**3**	**3**	**3**	2	**3**	1	1	1	1	2	1	2	3	3	3
CO3	**3**	**3**	**3**	2	**3**	1	1	1	1	2	1	2	2	3	3
CO4	**3**	**2**	**3**	2	**3**	1	1	1	1	2	1	2	3	3	2
CO5	2	**2**	2	**3**	**3**	1	1	1	1	2	1	**3**	2	3	2

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S24AT462ANALOGANDDIGITALCOMMUNICATIONSYSTEMSLABORATORY

LTPC

0021

COURSEOBJECTIVES:

1. TostudytheAM&FMModulationandDemodulation.
2. TolearnandrealizetheeffectsofsamplingandTDM.
3. TounderstandthePCM&DigitalModulation.
4. To SimulateDigitalModulationSchemes.
5. ToImplementEqualizationAlgorithmsandErrorControlCodingSchemes.

LISTOFEXPERIMENTS

- AM-ModulatorandDemodulator
- FM-ModulatorandDemodulator
- Pre-EmphasisandDe-Emphasis.
- Signalsamplingand TDM.
- PulseCodeModulationandDemodulation.
- PulseAmplitudeModulationand Demodulation.
- PulsePositionModulation and DemodulationandPulseWidthModulation andDemodulation.
- DigitalModulation–ASK,PSK,FSK.
- DeltaModulationandDemodulation.
- SimulationofASK,FSK,andBPSKGenerationandDetectionSchemes.
- SimulationofDPSK,QPSKandQAMGenerationand DetectionSchemes.
- SimulationofLinearBlockandCyclicErrorControlcodingSchemes.

COURSEOUTCOMES:

Attheendofthelaboratorycourse, thestudent willbeabletounderstandthe: CO1:
Design AM, FM & Digital Modulators for specific applications.
CO2:Computethesamplingfrequencyfordigitalmodulation.
CO3:Simulate&validatethevariousfunctionalmodulesofCommunicationsystem.
CO4:Demonstratetheirknowledgeinbasebandsignalingschemesthroughimplementationofdigital modulation schemes.
CO5:Applyvariouschannelcodingschemes&demonstratetheircapabilitiestowardstheimprovementof the noise performance of Communication system.

CO's-PO's & PSO's MAPPING

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	1	1	1	1	2	1	2	3	2	2
CO2	3	3	2	2	2	1	1	1	1	2	1	2	2	3	2
CO3	3	3	3	2	2	1	1	1	1	2	1	2	3	3	2
CO4	3	3	3	2	2	1	1	1	1	2	1	2	3	3	2
CO5	3	3	3	2	3	1	1	1	1	2	1	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation's