SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.E- Electronics and Communication Engineering

CURRICULUM and SYLLABI

[For students admitted in 2024-2025]

B.E / B.Tech Regulations 2023

Approved by BOS and Academic Council meetings

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type
	Theory Courses									
1.	U23ENG101A	Communication Skills in English	2	0	2	0	3	HS	60	TL
2.	U23MAT102B	Linear Algebra and Multivariable Calculus with MATLAB	3	0	2	0	4	BS	75	TL
3.	U23PHY103B	Engineering Physics	3	0	0	0	3	BS	45	T
4.	U23CHE104B	Chemistry of Electronic Materials	2	0	2	0	3	BS	60	TL
5.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T
6.	U23EC101	Fundamentals of Electrical and Electronics	2	0	2	0	3	PC	60	TL
7.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T
8.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T
	Practical Courses									
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L
		Total Credits					**21**			
	Optional Language Elective*									
10.	U23OL1101	French	1	0	0	0	1	OL	15	T
11.	U23OL1102	German							15	T
12.	U23OL1103	Japanese							15	T
13.	U23OL1104	Korean							15	T
14.	U23OL1105	Hindi							15	T

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project

**Students may opt for foreign languages viz., German/French/Japanese/Korean/Hindi with additional one credit. (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	**Chairperson, ECE BoS**	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.M.Renuga	**Dr.R.S.Sabeenian**	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

Copy to:-
HOD/Electronics and Communication Engineering, First Semester B.E.ECE, Students and Staff, COE

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T
2.	U23MAT202B	Transforms and Differential Equations	3	1	0	0	4	BS	60	TT
3.	U23PHY203C	Physics for Electronics and Communication Engineering	2	0	2	0	3	BS	60	TL
4.	U23EGR207	Engineering Graphics	3	0	0	0	3	ES	45	T
5.	U23EC201	Electronic Devices and Circuits	3	0	0	0	3	PC	45	T
6.	U23CPR205	Programming in C	3	0	0	0	3	ES	45	T
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
9.	U23CPL212	C Programming Laboratory	0	0	2	0	1	ES	30	L
10.	U23EC202	Electronic Devices and Circuits Laboratory	0	0	2	0	1	PC	30	L
Total Credits							21			
Optional Language Courses**										
11.	U23OL1201	French-II	1	0	0	0	1	OL	15	T
12.	U23OL1202	German-II							15	T
13.	U23OL1203	Japanese-II							15	T
14.	U23OL1204	Korean-II							15	T
15.	U23OL1205	Hindi-II							15	T

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**Students may opt for foreign languages viz., German/French/Japanese/Korean/Hindi with additional one credit (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	Chairperson, ECE BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.R.S.Sabeenian	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

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HOD/ Electronics and Communication Engineering, Second Semester B.E.ECE, Students and Staff, COE

ECE
III

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23MAT301C	Probability and Stochastic Processes	3	1	0	0	4	BS	60	TT
2.	U23EC301	Signals and Systems	3	0	2	0	4	PC	75	TL
3.	U23EC302	Digital Electronics	3	0	2	0	4	PC	75	TL
4.	U23EC303	Analog Circuits	3	0	0	0	3	PC	45	T
5.	U23EC304	Circuit Theory	3	0	0	0	3	PC	45	T
6.	U23CS308	Data Structures	3	0	0	0	3	ES	45	T
7.	noc25-mg106	**NPTEL**: Design Thinking- A Primer	1	0	0	0	1	ES	15	T
8.	U23GE302	**Audit Course**: Environment and Climate Science	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23EC305	Analog Circuits Lab	0	0	2	0	1	PC	30	L
10.	U23CS309	Data Structures lab	0	0	2	0	1	ES	30	L
11.	U23GE301	Soft Skills and Aptitude-I	0	0	2	0	1	EEC	30	L
Total Credits							25			

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project. P-Project

Approved By

14/6/2025	20/6/25		
Chairperson, Electronics and Communication Engineering BoS	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.R.S.Sabeenian	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

Dr. R.S. SABEENIAN, M.E.,Ph.D.,
MBA.,FIETE, FIE(I), MIEEE.,MISTE.,MIUPRAI.,
Professor & Head of the Department,
Department of Electronics and Communication Engineering
Sona College of Technology,
Salem-636 005. Tamil Nadu

Copy to:-
HOD, Electronics and Communication Engineering, Third Semester B.E. ECE Students and Staff, COE

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23EC401	Electromagnetics and Transmission Lines	3	1	0	0	4	PC	60	TT
2.	U23EC402	Microprocessors and Microcontrollers	3	0	0	0	3	PC	45	T
3.	U23EC403	Control Systems	3	0	0	0	3	PC	45	T
4.	U23EC404	Digital Signal Processing	3	0	2	0	4	PC	75	TL
5.	U23EC405	Analog Communication Systems	2	0	2	0	3	PC	60	TL
6.	U23IT408	Database Management Systems	3	0	0	0	3	ES	45	T
7.	U23GE402	**Audit Course**: Essence of Indian Traditional Knowledge	2	0	0	0	0	AC	30	T
Practical courses										
8.	U23EC406	Microprocessors and Microcontrollers Laboratory	0	0	2	0	1	PC	30	L
9.	U23IT409	Database Management Systems Laboratory	0	0	2	0	1	ES	30	L
10.	U23ENG401	Communication Skills Laboratory	0	0	2	0	1	EEC	30	L
11.	U23GE401	Soft Skills and Aptitude-II	0	0	2	0	1	EEC	30	L
Total Credits							24		480	

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project, P-Project

Approved By

12/12/2025	Nivakumar	J. Akilandeswari	J. Akilandeswari
Chairperson, Electronics and Communication Engineering BoS	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.R.S.Sabeenian	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

Copy to:-

HOD/ Electronics and Communication Engineering, Fourth Semester B.E. ECE Students and Staff, COE

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type
	Theory Courses									
1.	U23ENG101A	Communication Skills in English	2	0	2	0	3	HS	60	TL
2.	U23MAT102B	Linear Algebra and Multivariable Calculus with MATLAB	3	0	2	0	4	BS	75	TL
3.	U23PHY103B	Engineering Physics	3	0	0	0	3	BS	45	T
4.	U23CHE104B	Chemistry of Electronic Materials	2	0	2	0	3	BS	60	TL
5.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T
6.	U23EC101	Fundamentals of Electrical and Electronics	2	0	2	0	3	PC	60	TL
7.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T
8.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T
	Practical Courses									
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L
		Total Credits					**21**			
	Optional Language Elective*									
10.	U23OL1101	French	1	0	0	0	1	OL	15	T
11.	U23OL1102	German							15	T
12.	U23OL1103	Japanese							15	T
13.	U23OL1104	Korean							15	T
14.	U23OL1105	Hindi							15	T

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project

**Students may opt for foreign languages viz., German/French/Japanese/Korean/Hindi with additional one credit. (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	**Chairperson, ECE BoS**	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.M.Renuga	**Dr.R.S.Sabeenian**	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

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U23ENG101A	Communication Skills in English (Common to ADS, AIML, BME, CSD, CSE, CIVIL, ECE, EEE, MCT, FT, IT Branches)	L	T	P	J	C
		2	0	2	0	3

Course Outcomes

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

CO1:	Use grammatical components effectively in both written and spoken communication
CO2:	Develop speaking skills for self-introduction, delivering speeches and technical presentation
CO3:	Demonstrate effective listening skills for academic and professional purposes
CO4:	Write emails and formal letters and build resumes and construct paragraphs
CO5:	Develop speaking skills both in terms of fluency and comprehensibility

Pre-requisite:

- Knowledge and Understanding of Grammar
- Fundamental Language Skills (LSRW)

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	1	1	3	3	2	3	3	2	3	2	3
CO2	1	1	1	1	1	3	3	3	3	3	3	3	3	3
CO3	1	2	3	2	2	3	3	2	3	3	3	3	3	3
CO4	1	2	1	2	2	3	3	3	3	3	3	3	3	3
CO5	1	2	2	3	2	3	3	3	3	3	3	3	3	3

Course Assessment methods

Direct		Indirect
CIE test I (10) (Theory) CIE test II (10) (Theory) CIE test III (10) (Theory) CIE test IV (10) (Practical) Assignment/seminar/Quiz (5)	Attendance (5) Total CIE: 50 marks Semester End Examination (50) (SEE – Theory (25 marks + Lab (25 marks)	Course end survey

Unit 01: **6 Hours**

- General vocabulary, Parts of Speech, Articles
- Email, fixing an appointment, cancelling appointments, conference details, hotel accommodation, order for equipment, training programme details, paper submission for seminars and conferences
- Paragraph writing – Describing – defining – providing examples or evidences

Unit 02:	6 Hours
• Tenses, Sentence Patterns • Instructions • Letter Writing - calling for quotations, placing orders	
Unit 03:	**6 Hours**
• Prefixes and Suffixes • Cover letter and resume writing	
Unit 04:	**6 Hours**
• Modal verbs, concord • Checklist • Letter Writing - Business communication, complaints, replies to queries from business customers	
Unit 05:	**6 Hours**
• If conditionals • Letter Writing - inviting dignitaries, accepting and declining invitations	

Lab component:

1. Self-introduction, personal information, name, home background, study details, area of interest, hobbies, strengths and weaknesses, projects and paper presentations, likes and dislikes in food, travel, clothes, special features of home town.
2. Mini presentation - Office Arrangements, Facilities, Office Functions, Sales, Purchases, Training Recruitment, Advertising, Applying for financial assistance, applying for a job.
3. Listening - understanding short conversations or monologues, taking down phone messages, orders, notes, etc.
4. Listening – entering information in tabular form
5. Loud Reading

Theory: 30 Hrs	Tutorial: --	Practical: 30 hours-	Project:--	Total Hours: 60 Hrs

TEXT BOOKS

1.	Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016
2.	**Extensive Reading** 1. She is Dancing Back to Life – A Short Story" 2. The Story of Google – Sara Gilbert, published by Jaico 3. The Story of Amazon.com- Sara Gilbert, published by Jaico

REFERENCES

1.	Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
2.	A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.

HOD

Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology,
SALEM - 6

B. E. / ELECTRONICS AND COMMUNICATION ENGINEERING						
SEMESTER - I	LINEAR ALGEBRA AND MULTIVARIABLE CALCULUS WITH MATLAB	L	T	P	J	C
U23MAT102B		3	0	2	0	4

Course Outcomes

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

CO1:	apply the concepts of vector spaces and linear transformations in real world applications
CO2:	apply the concepts of eigenvalues and eigenvectors of a real matrix and their properties to diagonalize the matrix.
CO3:	find the Taylor's series expansion, Jacobians and the maxima and minima of functions of two variables
CO4:	apply appropriate techniques of multiple integrals to find the area and volume
CO5:	apply the concepts of vector differentiation and integration to find the area and volume.

Pre-requisites:

- Fundamentals of elementary algebra
- Fundamentals of calculus
- Fundamentals of geometry
- Fundamentals of trigonometry

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3								2	3	
CO2	3	3		3								2	3	
CO3	3	3		3								2	3	
CO4	3	3		3								2	3	
CO5	3	3		3								2	3	

Course assessment methods [Theory with laboratory course]

Direct		Indirect
CIE test I (10) (Theory) CIE test II (10) (Theory) CIE test III (10) (Theory) CIE test IV (10) (Practical) Attendance (5) Assignment/Quiz/Seminar (5)	Total CIE: 50 marks Semester End Examination (50) [SEE- Theory (35) + Lab(15) marks]	Course end survey

Unit 01	VECTOR SPACES	9 Hours

Vector space – linear independence and dependence of vectors – basis – dimension – linear transformations (maps) – matrix associated with a linear map – range and kernel of a linear map.

Unit 02	EIGENVALUES AND EIGENVECTORS	9 Hours

Eigenvalues and eigenvectors of real matrices – properties of eigenvalues and eigenvectors – Cayley-Hamilton theorem – diagonalization of real symmetric matrices.

Unit 03	FUNCTIONS OF SEVERAL VARIABLES	9 Hours

Functions of several variables – partial differentiation – total derivative – Jacobians – Taylor's theorem for functions of two variables – maxima and minima of functions of two variables without constraints – constrained maxima and minima by Lagrange's method of undetermined multipliers.

Unit 04	MULTIPLE INTEGRALS	9 Hours
Double integrals – change of order of integration – change of variables from Cartesian to polar coordinates – area as double integrals in Cartesian coordinates – triple integrals – volume as triple integrals in Cartesian coordinates.		
Unit 05	**VECTOR CALCULUS**	**9 Hours**
Vector differentiation: Scalar and vector valued functions – gradient, directional derivative, divergence and curl – scalar potential. **Vector integration:** Line, surface and volume integrals – statement of Green's, Stoke's and Gauss divergence theorems – simple applications involving squares, rectangles, cubes and rectangular parallelopiped.		

	List of MATLAB Programs
1.	Programs based on elementary operations on matrices
2.	Computing the rank of a matrix
3.	Finding eigenvalues and eigenvectors of a matrix
4.	Finding partial derivatives of functions of several variables
5.	Computing stationary points of functions of two variables
6.	Taylors series expansion of functions of two variables
7.	Evaluating double integrals
8.	Finding area as double integrals
9.	Evaluating triple integrals
10.	Finding volume as triple integrals

Theory: 45 Hrs	Tutorial: -	Practical: 30 Hrs	Project:--	Total Hours: 75 Hrs

TEXT BOOKS:

1. T. Veerarajan, "Linear Algebra and Partial Differential Equations", McGraw Hill Publishers, 1st Edition, 2018.
2. T. Veerarajan, "Engineering Mathematics for Semesters I & II", McGraw Hill Publishers, 1st Edition, 2019.
3. W. Yang, Y. K. Choi, K. Jaekwon, M. C. Kim, H. J. Kim and T. Im, "Engineering Mathematics with MATLAB", CRC Press Publishers, 1st Edition, 2017.

REFERENCE BOOKS:

1. S. Lipschutz and M. L. Lipson, "Linear Algebra", McGraw Hill Publishers, 6th Edition, 2018.
2. E. Kreyszig, "Advanced Engineering Mathematics", Wiley Publishers, 10th Edition, Reprint, 2017.
3. C. Prasad and R. Garg, "Advanced Engineering Mathematics", Khanna Publishers, 1st Edition, 2018.
4. B. V. Ramana, "Higher Engineering Mathematics", McGraw Hill Publishers, 29th Reprint, 2017.
5. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44th Edition, 2018.
6. D. Xu, "Calculus problem solutions with MATLAB", Walter de Gruyter Publishers, 1st Edition, 2020.

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SALEM - 636 005.

U23PHY103B	ENGINEERING PHYSICS (Common to CSE, CSD, AIML & ECE)	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Analyse the relation between arrangement of atoms and material properties.
CO2:	Discuss the dual nature of matter and radiation and the application of wave nature of particles.
CO3:	Describe the basic components of lasers
CO4:	Differentiate the electrical and thermal conductivity of metals
CO5:	Elucidate the classification and theory of semiconducting materials

Pre-requisite:

Basic knowledge in atomic physics and optics.

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	2	2	-	-	2	-	2	-	3
CO2	3	2	-	-	-	2	2	-	-	2	-	2	-	3
CO3	3	2	-	-	-	2	2	-	-	2	-	2	-	3
CO4	3	2	-	-	-	2	2	-	-	2	-	2	-	3
CO5	3	2	-	-	-	2	2	-	-	2	-	2	-	3

Course Assessment methods

Direct		Indirect
CIE test I (8) CIE test II (8) CIE test III (8) Assignment/Seminar/Quiz (5)	Objectives Test (6) Attendance (5) Total CIE: 40 marks Semester End Examination (60)	Course End Survey

Unit 01: CRYSTAL PHYSICS — **9 Hours**

Importance of crystals - Types of crystals - Basic definitions in crystallography (Lattice -space lattice - unit cell - lattice parameters - basis) - Bravais lattices - Lattice planes and Miller indices - Interplanar distance - d spacing in cubic lattice - Calculation of number of atoms per unit cell - Atomic radius - Coordination number - Atomic Packing Factor for SC, BCC, FCC and HCP structures - Polymorphism and allotropy - Crystal

imperfections - Point, line and surface defects - Burger vector.	
Unit 02: QUANTUM PHYSICS	**9 Hours**
Limitations of classical theory - Dual nature of matter and radiation - Compton effect - Expression for Compton shift (no derivation) - de Broglie waves - Heisenberg's Uncertainity principle - Schrodinger's time independent and time dependent wave equations - Physical significance of wave function - Energy and wave function of an electron trapped in one dimensional box - Application of wave nature of particles - Electron microscope - Comparison of optical and electron microscope - Scanning electron microscope - Limitations of electron microscope.	
Unit 03: LASERS	**9 Hours**
Energy level - Stimulated absorption - Population inversion - Meta stable state - Spontaneous emission - Stimulated emission - Basic *components* of a laser - Einstein's theory of spontaneous and stimulated emission of radiation - Types of lasers - Solid state laser - Nd:YAG laser - Gas laser - CO_2 laser - Semiconductor laser - Homojunction and hetero junction laser - Holography - Construction and reconstruction of hologram - Application of laser in industry – Cutting, welding and drilling – Medical applications – Lasik.	
Unit 04: CONDUCTING MATERIALS	**9 Hours**
Basic definitions - Classical free electron theory of metals - Expression for electrical conductivity and thermal conductivity - Wiedemann Franz law - Lorentz number - Drawbacks of classical free electron theory - Quantum theory - band theory of solids (qualitative treatment only) - Fermi energy and Fermi distribution function - Effect of temperature on Fermi function - Density of energy states - Carrier concentration in metals.	
Unit 05: SEMICONDUCTING MATERIALS	**9 Hours**
Intrinsic semiconductors - Energy band diagram - Direct and indirect band gap semiconductors - Carrier concentration in intrinsic semiconductors - Fermi level - Variation of Fermi level with temperature - Electrical conductivity - Band gap determination - Extrinsic semiconductors - Carrier concentration in n-type and p-type semiconductors (Qualitative Treatment only) - Variation of Fermi level with temperature and impurity concentration - Hall effect - Determination of Hall coefficient - Applications.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1. M.N. Avadhanulu, P.G. Kshirsagar , "A Textbook of Engineering Physics", S.Chand & Company Ltd, New Delhi 2014.
2. D. K. Bhattacharya, Poonam Tandon "Engineering Physics", Oxford University Press 2017.

REFERENCES

1. "Engineering Physics", Sonaversity, Sona College of Technology, Salem, Revised Edition 2018.

2.	B. K. Pandey and S. Chaturvedi, "Engineering Physics", Cengage Learning India Pvt. Ltd., Delhi, 2021.
3.	V. Raghavan, "Materials Science and Engineering: A First Course" Prentice Hall India Learning Private Limited, 6th Edison, 2015.
4.	William D. Callister Jr., David G. Rethwisch, "Callister's Materials Science and Engineering", 10th Edition, Global Edition 2019.
5.	R.Wolfson, "Essential University Physics", Volume 1 & 2. Pearson Education (Indian Edition), 2009.

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Dr. M. RENUGA,
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U23CHE104B	CHEMISTRY OF ELECTRONIC MATERIALS (Common to Electronics and Communication Engineering & Electronics and Computer Engineering)	L	T	P	J	C
		2	0	2	0	3

Course Outcomes

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

CO1:	Understand the concepts of electrochemistry and its applications in engineering and technology.
CO2:	Analyze the methods of synthesis, conducting mechanism, characteristics and commercial applications of conducting polymers.
CO3:	Acquire the knowledge of optoelectronic devices and an understanding of the trade-offs when using these devices in their respective applications.
CO4:	Describe the working principle and application of various electrochemical processes carried out in electronic industries.
CO5:	Analyze the need of e-waste management and disposal methods across the globe.

Pre-requisite: Basic knowledge on the concepts of organic, inorganic and physical chemistry.

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2												2
CO2	3	2												2
CO3	3	2					2							2
CO4	3	2					2							2
CO5	3	2					3							2

Course Assessment methods

Direct		Indirect
CIE test I (10) CIE test II (10) CIE test III (10) CIE test IV(10)(Practical)	Assignment/seminar/Quiz(5) Attendance (5) Total CIE: 50 marks Semester End Examination (50)	Course end survey

Unit 01: ELECTROCHEMISTRY	6 Hours

Electrode potential-Nernst equation - derivation and problems based on single electrode potential calculation-Reference electrodes - Standard hydrogen electrode - Calomel electrode - Glass electrode - measurement of pH - Electrochemical series – Significance – Measurement of emf by Pogendorff's method - Potentiometric titrations (redox Fe^{2+} Vs Dichromate) - Conductometric titrations (HCl vs NaOH).

Unit 02: INTRODUCTION TO MOLECULAR ELECTONICS	6 Hours

Introduction-organic semiconductors for molecular electronics – concepts and choice of suitable organic molecules – principles in optical properties - potential applications of electronic components formed from single, or small groups of molecules - Conducting polymers - Synthesis of polyacetylene-polythiophene-structure property relationships - doping concept in conducting polymers - Graphene Oxide - Preparation (Hummer's method), properties and commercial applications.

Unit 03: OPTOELECTRONIC MATERIALS	6 Hours

Electroluminescence-Exciton-OLED materials–Organic field effect transistors - Liquid crystalline polymers-classification of liquid crystals, chemical constitution, stability and applications - Organic solar cells - perovskite, linear heterojunction and bulk heterojunction - Dye sensitized organic solar cells – working principles, nature of materials, advantages and disadvantages.

Unit 04: ELECTROCHEMICAL PROCESSING	6 Hours

Electroplating-Principle and process - Plating Parameters - Current and energy efficiency-Electroplating of Cu and Ni -Fundamentals of electroless deposition - Electroless plating of Cu and Ni-Fabrication of PCB's-Electrochemical etching of copper from PCB's-Anodizing-Definition-Principle and working methodology of aluminium anodizing- Cyclic voltammetry- basic principles and applications - Electrochemical Sensors – definitions and applications.

Unit 05: E-WASTE MANAGEMENT	6 Hours

Introduction-Components of E-waste-Need of E-waste Management-Pollutants in E-waste-Impact on environment and human health-E-waste methods of disposal-Recycling process-Advantages-Recycling of PCB and battery components-Recycling of conventional solar cells-Extraction of copper and gold from e-waste (PCB).

List of Experiments **30 Hours**

1) Estimation of HCl by pH metry.
2) Estimation of HCl by conductometry (HCl Vs NaOH).
3) Estimation of mixture of acids by conductometry (HCl + CH_3COOH Vs NaOH).
4) Estimation of ferrous ion by potentiometric titration.
5) Estimation of copper content from discarded PCBs by EDTA method.
6) Estimation of chromium prepared from electroplating sludge by Permanganometry.
7) Determination of molecular weight of a polymer by viscosity measurements.
8) Estimation of hardness of water sample by EDTA method.
9) Estimation of alkalinity of water sample by indicator method.
10) Estimation of iron content in water by spectrophotometry.

Theory: 30 Hrs	Tutorial: 0	Practical: 30 Hrs	Project: 0	Total Hours: 60 Hrs

TEXT BOOKS

1. Engineering Chemistry, P C Jain & Monica Jain, Dhanpat Rai Publication, 2015-16th Edition.

2.	Sam-Shajing Sun, Larry R. Dalton "Introduction to Organic Electronic and Optoelectronic Materials and Devices", CRC press., London, 2017, 2nd edition.
REFERENCES	
1.	Bansi D. Malhotra "Handbook of Polymers in Electronics", Rapra Technology Ltd.., UK, 2002. 1st edition.
2.	Stergios Logothetidis "Handbook of Flexible Organic Electronics Materials - Manufacturing and Applications", WoodHead publishing., London, 2015. , 1st edition.
3.	Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 3rd edition 2013.
4.	OLED Display Fundamentals and Applications, TakatoshiTsujimura, Wiley–Blackwell , 2012.

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U23PPR105	PROBLEM SOLVING USING PYTHON PROGRAMMING (Common to ADS, IT, CSE, CSE(AIML), CSD, CIVIL, BME, ECE, EEE, MECH and MCT Branches)	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Develop algorithmic solutions to simple computational problems
CO2:	Write simple Python programs
CO3:	Write programs with the various control statements and handling strings in Python
CO4:	Develop Python programs using functions and files
CO5:	Analyze a problem and use appropriate data structures to solve it.

Pre-requisite: NIL

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	1	1									1
CO2	2	2	3	1	1									1
CO3	2	2	3	1	1									1
CO4	2	2	3	1	1									1
CO5	2	2	3	1	1									1

Course Assessment methods

Direct		Indirect
CIE test I (8) CIE test II (8) CIE test III (8) Assignment/seminar/Quiz (5)	Objectives Test (6) Attendance (5) Total CIE: 40 marks Semester End Examination (60)	Course end survey

Unit 01: ALGORITHMIC PROBLEM SOLVING — **9 Hours**

Need for computer languages, Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).

Unit 02: BASICS OF PYTHON PROGRAMMING — **9 Hours**

Introduction-Python Interpreter-Interactive and script mode -Values and types, variables, operators, expressions, statements, precedence of operators, Multiple assignments, comments, input function, print function, Formatting numbers and strings, implicit/explicit type conversion.

Unit 03: CONTROL STATEMENTS AND STRINGS — **9 Hours**

Conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration-while, for, infinite loop, break, continue, pass, else. Strings-String slices, immutability, string methods and operations.

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Unit 04: FUNCTIONS, FILES AND MODULES	9 Hours
Functions - Introduction, inbuilt functions, user defined functions, passing parameters - positional arguments, default arguments, keyword arguments, return values, local scope, global scope and recursion. Files -Text files, reading and writing files. Modules – create – import.	
Unit 05: DATA STRUCTURES: LISTS, SETS, TUPLES, DICTIONARIES	**9 Hours**
Lists-creating lists, list operations, list methods, mutability list functions, searching and sorting, Sets-creating sets, set operations. Tuples-Tuple assignment, Operations on Tuples, lists and tuples, Tuple as return value- Dictionaries-operations and methods, Nested Dictionaries, Union Operation.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	Reema Thareja, "Problem Solving and Programming with Python" Oxford University Press, 2nd Edition 2023.

REFERENCES

1.	Ashok Namdev Kamthane, Amit Ashok Kamthane, "Programming and Problem Solving with Python" Mc-Graw Hill Education, 2018.
2.	Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus" Wiley India Edition, 2013.
3.	Allen Downey, "Think Python: How to Think Like a Computer Scientist" O'Reilly Media, 2nd Edition 2016.
4.	Timothy A. Budd," Exploring Python" Mc-Graw Hill Education (India) Private Ltd., 2015.

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U23PPL112	PYTHON PROGRAMMING LABORATORY (Common to ADS, IT, CSE, CSE(AIML), CSD, CIVIL, BME, ECE, EEE, MECH and MCT Branches)	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1:	Implement the algorithms using basic control structures in Python
CO2:	Develop Python programs to use functions, strings and data structures to solve different types of problems
CO3:	Implement persistent storing information through file operations

Pre-requisite: NIL

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	2	1								1
CO2	3	3	3	3	2	2								1
CO3	3	3	3	3	2	2								1

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz I- (5) CIE test II (15) Quiz II- (5)	RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination (40 marks)	Course end survey

LIST OF EXPERIMENTS

1. Draw flowchart using any open source software.
2. Implement programs with simple language features.
3. Implement various branching statements in python.
4. Implement various looping statements in python.
5. Develop python programs to perform various string operations like concatenation, slicing, indexing.
6. Implement user defined functions using python.
7. Implement recursion using python.
8. Implement python program to perform operations on file and module.
9. Develop python programs to perform operations on list and tuples.
10. Implement dictionary and set in python.

Theory: --	Tutorial: --	Practical: 30Hrs	Project: --	Total Hours: 30 Hs

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U23EC101	FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS	L	T	P	J	C
		2	0	2	0	3

Course Outcomes

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

CO1:	Realize the basic concepts of electrical quantities and components.
CO2:	Understand the workings of electrical machines.
CO3:	Analyze the construction and characteristics of semiconductor devices.
CO4:	Examine the BJT formation and its characteristics and Identify the applications of BJT.
CO5:	Describe the operational principles of Special Devices

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	1	1	2	3	2	2		1	2	3	3	2
CO2	1	1	2	2	1	3	2	1		3	1	3	1	
CO3	1	3	2	3	2	3	2	2		3	2	3	3	2
CO4	1	2	2	3	2	3	2	1		3	2	3	3	2
CO5	1	2	2	3	2	3	2	1		3	2	3	3	2

Course Assessment methods

Direct		Indirect
CIE test I (10) CIE test II (10) CIE test III (10) CIE test IV(10)(Practical)	Assignment/seminar/Quiz(5) Attendance (5) Total CIE: 50 marks Semester End Examination (50)	Course end survey

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Unit 01: BASIC OF ELECTRICAL PERCEPTIONS	6 Hours

Definition of Electric Voltage, Current, Power, Energy, Ohms law, Limitations of Ohms law, Comparison of AC & DC Signals- Resistance in series and parallel combinations- comparison of series and parallel circuits- Series combination of capacitance and Inductance – Kirchhoff's Law – simple problems.

Unit 02: ELECTRICAL MACHINES	6 Hours

DC Generator and DC Motors: Construction and working principle – Types – EMF equation –**Transformer**: Construction and working principle – EMF equation.

Unit 03: BASIC SEMICONDUCTOR DEVICES	6 Hours

Energy band theory-Conductor-Insulator-Semiconductor- Review of intrinsic and extrinsic semiconductors – **Devices** – Construction of PN junction – VI Characteristics - Transition and diffusion capacitances - Zener diode- VI characteristics - Zener diode as voltage regulator.

Unit 04: BJT AND ITS APPLICATIONS	6 Hours

Bipolar Junction Transistor – Construction and working - Input and Output characteristics in CB, CE, CC Configurations —Application of transistor as a switch.

Unit 05: SPECIAL DEVICES	6 Hours

Construction, working & Characteristics of – Tunnel Diode - Varactor diode - Photo diode - Photo transistor- UJT - SCR – TRIAC - DIAC.

List of Experiments **30 Hours**

1) Measurement of AC and DC signals using Measuring Instruments
2) Realization and design problem on Ohms Law
3) Realization and design problem on KCL and KVL
4) VI characteristics of PN junction diode
5) VI characteristics of Zener Diode
6) Input and Output Characteristics of BJT in CE configuration
7) Input and Output Characteristics of BJT in CC configuration
8) Input and Output Characteristics of BJT in CB configuration
9) Realization of transistor as switch

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10) VI characteristics of UJT 11) VI characteristics of SCR 12) VI characteristics of TRIAC 13) Simulation of Servo Motor to study its performance

Theory: 30 Hrs	Tutorial: 0	Practical: 30 Hrs	Project: 0	Total Hours: 60 Hrs

TEXT BOOKS	
1.	D P Kothari and I J Nagrath, "Basic Electrical and Electronics Engineering", Mc Graw Hills (India) Private Limited, 2nd Edition 2020.
2.	Salivahanan S. and Sureshkumar N., "Electronic Devices and Circuits", 4th Edition, McGraw-Hill, New Delhi, 2017
REFERENCES	
1.	D. Devaraj, S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson India, 2017
2.	Abhi Chakrabarti, Sudipta Debnath, Soumitra Kumar Mandal, "Basic Electrical & Electronics Book ", Mc Graw Hill Education; Fifth Edition, 2016.
3.	Ravish Singh, " Basic Electrical & Electronics Engineering", McGraw Hill Education, 2014

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U23TAM101	தமிழர் மரபு / Heritage of Tamils	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Describe Tamil Language and Literature
CO2:	Analyse Heritage - Rock Art Paintings To Modern Art – Sculpture
CO3:	Explain Folk and Martial Arts
CO4:	Describe Thinai Concept of Tamils
CO5:	Analyse Contribution of Tamils to Indian National Movement and Indian Culture

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

அலகு 1 : மொழி மற்றும் இலக்கியம் — 3 Hours

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி -தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு 2 : மரபு – பாறை ஓவியங்கள் முதல் ஓவியங்கள் வரை – சிற்பக் கலை — 3 Hours

நடுகல் முதல் சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை- சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக் கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு

அலகு 3: நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள் — 3 Hours

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோலபாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு 4: தமிழர்களின் திணைக் கோட்பாடுகள் — 3 Hours

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் -

சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.				
அலகு 5: இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு				**3 Hours**
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.				
Theory: 15 Hrs	**Tutorial: --**	**Practical: --**	**Project:--**	**Total Hours: 15 Hrs**

REFERENCES

1	தமிழக வரலாறு – மக்களும் பண்பாடு – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2	கணினித் தமிழ் - முனைவர் இல.சுந்தரம்.(விகடன் பிரசுரம்).
3	கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4	பொருநை –ஆற்றங்னரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
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) (Published by: 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 C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & 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) (Published by: The Author)
11	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

HOD

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U23TAM101	தமிழர் மரபு / Heritage of Tamils	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Describe Tamil Language and Literature
CO2:	Analyse Heritage - Rock Art Paintings To Modern Art – Sculpture
CO3:	Explain Folk and Martial Arts
CO4:	Describe Thinai Concept of Tamils
CO5:	Analyse Contribution of Tamils to Indian National Movement and Indian Culture

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: **LANGUAGE AND LITERATURE**	3 Hours
Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact 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..	
Unit 02: **HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE**	3 Hours
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	
Unit 03: FOLK AND MARTIAL ARTS	**3 Hours**
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils	
Unit 04: THINAI CONCEPT OF TAMILS	**3 Hours**
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.	
Unit 05: CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	**3 Hours**
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

REFERENCES

1	தமிழக வரலொறு – மக்களும் பண் பொடும் – மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2	கணினித ் தமிழ் – முமனவர ்இல. சுந்தரம் . (விகடன் பிரசுரம்).

3	கீழடி – மவமக நதிக்கமரயில் ெங்ககொல நகர நொகரிகம் (ததொல்லியல் துமறதவளியீடு)
4	பொருமந – ஆற்றங்கமர நொகரிகம். (ததொல்லியல் துமற தவளியீடு)
5	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
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) (Published by: 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 C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & 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) (Published by: The Author)
11	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

HOD

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U23GE101	BASIC APTITUDE-1	L	T	P	J	C
		2	0	0	0	0

Course Outcomes

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

CO1:	Solve the problems in Divisibility , Division algorithm ,Successive Division and HCF & LCM. Identify Synonyms and Antonyms.
CO2:	Elucidate the problems in BODMAS rule, Approximation, Surds and Indices, Algebraic Simplification and Square root and Cube root. Choose appropriate Verbal Analogies and edit the given passages.
CO3:	Crack the problems involving Ratio and Proportion, and discuss Proportionality Theorems. Comprehend the given passages for Reading Comprehension activity and answer the questions correctly.
CO4:	Deduce the problems involving Linear equation and Quadratic equation. Demonstrate good vocabulary skill by doing the one word substitution and sentence filler exercise with high degree of accuracy.
CO5:	Interpret the logical reasoning problems from Number series ,Coding and Decoding and Exhibit good expertise in detecting errors in the given sentences.

Pre-requisite:

- Basic English language and Grammar knowledge
- Knowledge in Basic Mathematics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO 11	PO12
CO1	3	3	3	2	1	1	1	3	3	3	2	3
CO2	3	3	3	2	1	1	1	3	3	3	2	3
CO3	3	3	3	2	1	1	1	3	3	3	2	3
CO4	3	3	3	2	1	1	1	3	3	3	2	3
CO5	3	3	3	2	1	1	1	3	3	3	2	3

Course Assessment methods

Direct		Indirect
CIE test I (30) - Theory CIE test II (30) - Theory CIE test III (40) – Theory	Total CIE: 100 marks Semester End Examination – NIL	Course end survey

Unit 01	6 Hours
Number Properties: Classification of numbers - Divisibility - Division algorithm -Successive Division - HCF and LCM –Problems Verbal Aptitude: Synonyms and b. Antonyms	
Unit 02	**6 Hours**
Simplification: BODMAS Rule - Approximation - Surds and Indices - Algebraic Simplification - Square root and Cube root – Problems Verbal Aptitude: Verbal analogy, Editing passages	
Unit 03	**6 Hours**
Ratio and Proportion : Ratio - Properties of Ratios - Compound Ratio - Coin based problems - Proportion - Proportionality Test - Proportionality Theorems - Inverse Proportion - Variation - Problems Verbal Aptitude: Reading Comprehension	
Unit 04	**6 Hours**
Equations: a. Linear equation: Simultaneous Linear Equations - Consistent System - Inconsistent System - Problems b. Quadratic Equation: Different Ways to Express the Quadratic Equation - Discriminant of the Quadratic Equations - Roots - Nature of the Roots - Relation between roots and coefficient of equation - Formation of a Quadratic Equation – Problems Verbal Aptitude: One word substitution , Sentence filler words	
Unit 05	**6 Hours**
Logical Reasoning : Number series – Coding and Decoding – Problem Verbal Aptitude: Error detection	

Theory: 30 Hrs	Tutorial: 0	Practical: 0	Project: 0	Total Hours: 30 Hrs

TEXT BOOKS

1. S.Chand and Dr.R.S.Aggarwal, "Quantitative Aptitude for competitive examinations", S Chand and Company Limited 2019.
2. Nishit K.Sinha, "Logical Reasoning and Data Interpretation", Pearson 2021.

15/09/2023

Dr.S.Anita

Head/Training

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U23OL1101	French	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Read French phrases, Spell French phonitis, practice French accents, differentiate French and English sounds
CO2:	Introduce oneself, talk about someone, ask others personal information, identify an object, ask and respond politely in a conversation
CO3:	Read and write a small annoncement, describe about neighbours, write a small portrait
CO4:	Express one's wishes, talk about one's hobbies, ask time, describe one's status of life in a blog, justify a choice, express one's preferences, write a list of needs
CO5:	Suggest to do something, appreciate something, talk about a movie, write a postal card

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
Hr 2: Alphabets, Basic wishes, self-introduction, basic verbs: avoir and être Hr 4: Nationalities and countries, colors, days & months Hr 6: Definite articles, numbers 0-20, write about one's identification	
Unit 02:	**3 Hours**
Hr 8: Professions, conjugation: 1st group verbs, indefinite articles Hr 10: Preposition of place, identity card, negative sentence Hr 12: Things around us, subjective and ephatitic pronouns, self-introduction online	
Unit 03:	**3 Hours**
Hr 14: Talk about accommodation, conjugation: aller and venir, possessive adjectives Hr 16: Adjective's gender, noun's gender, things in a room, simple prepositions Hr 18: Physical description, speak about accommodation, writing a self-potrait	
Unit 04:	**3 Hours**
Hr 20: Hobbies, conjugation: vouloir, pouvoir and devoir, connected articles Hr 22: Interrogative adjectives, daily activities, time and seasons, pronominal verbs Hr 24: Near future tense, talk about preferences, write a mail	
Unit 05:	**3 Hours**
Hr 26: Outing activities, conjugation: faire and sortir, demonstrative adjectives Hr 28: Adverbs of frequency, family members, past tenses (passé composé and imparfait) Hr 30: French arts, talk about a film, and write a postal card	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1.	The course faculty will provide relevant audios, videos, handouts and notes
2.	Books : Saison (Méthode de français, cachier d'activités)
3.	Reference books : La conjugaison, Dondon, Echo

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U23OL1102	German	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Use common, everyday expressions to greet others and introduce themselves.
CO2:	Construct simple sentences /questions.
CO3:	Initiate and sustain basic conversation based on family, professions,
CO4:	Hobbies and food.
CO5:	Identify differences in using nouns based on gender.

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
• Greeting and taking leave, introducing oneself, introducing others	
Unit 02:	**3 Hours**
• Alphabets, spelling, numbers	
Unit 03:	**3 Hours**
• Age, Telephone/mobile numbers, Month, Date, Time	
Unit 04:	**3 Hours**
• Languages, Family, Asking/giving information about family members	
Unit 05:	**3 Hours**
• Hobbies, Professions	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1.	Netzwerk A1

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U23OL1103	Japanese	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Use words and phrases of greeting in Japanese, write the letters of the alphabet, identify names of objects and do a self-introduction using short and simple sentences
CO2:	Demonstrate the use of time-related words and verb conjunctions and make light conversation asking for directions and answering questions
CO3:	Use different kinds of verbs through the day and those used for giving things, and demonstrate the use of adjectives
CO4:	Express liking for the Japanese language, describe the locations of different things and demonstrate counting in Japanese
CO5:	Make comparisons of stated things, express a willingness to go to Japan and use 'Te-form' verbs

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
Hr 1-2: Greeting words and phrases; the Japanese alphabet: 104 Hiragana and 104 Katakana letters Hr 3-4: Identifying words from pictures or objects shown Hr 5-6: Self-introduction	
Unit 02:	**3 Hours**
Hr 7-8: Asking for directions when shopping Hr 9-10: Time words and Verb Conjugations Hr 11-12: Making light conversation	
Unit 03:	**3 Hours**
Hr 13-14: Expressions to use verbs from morning to night Hr 15-16: Verbs used for giving things Hr 17-18: Adjectives	
Unit 04:	**3 Hours**
Hr 19-20: Ways to show liking for the Japanese language Hr 21-22: Describing the location of things (or where things are) Hr 23-24: Japanese numbers and counting	
Unit 05:	**3 Hours**
Hr 25-26: Making comparisons Hr 27-28: Expressions wishing for something, like 'I want to go to Japan …!' Hr 29-30: Using 'Te-form' Verb	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1.	The course faculty will provide handouts / notes / course material.
2.	Books on Basic Japanese language available in the college library.

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College of Technol

U23OL1104	Korean	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Use single vowels and consonants syllable structure.
CO2:	Greet others and introduce themselves.
CO3:	Identify time , date and week
CO4:	Explain location and places
CO5:	Construct simple sentences / questions.

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: Hangeul	3 Hours
Single Vowels & Consonants Syllable Structure Tense Consonants Aspirated Consonants Double Vowels Final Consonants Double Final Consonants Liaison	
Unit 02: Introduction	3 Hours
Greetings Talking about names Self-introduction Introducing my family members	
Unit 03: Time and Date	**3 Hours**
Talking about location Talking about dates and days of the week Talking about doing something in the past	
Unit 04: Location and Places	**3 Hours**
Talking about location Talking about doing something at a location Talking about directions	
Unit 05: Future	**3 Hours**
Talking about doing something in the future Talking about plans for the future Talking about hope for the future	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

REFERENCES

1	Vitamin Korean - 1

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U23OL1105	Hindi	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Write स्वर(अ - अः), व्यंजन(क - श्र)
CO2:	Identify and write बारहखडी(क - श्रः)
CO3:	Coin 2,3&4 letters words
CO4:	Read and frame sentences (grammar, verb, noun, pronoun, adjective, etc…)
CO5:	Communicate effectively using tenses (with Continuous)

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: स्वर (अ - अः), व्यंजन (क - श्र)	3 Hours
Hindi letters learning Letters identification Reading Writing Letters pronunciation	
Unit 02: बारहखडी (क - श्रः)	3 Hours
Hindi letters learning Letters identification Reading Writing Letters pronunciation	
Unit 03: 2,3 & 4 letters words	**3 Hours**
Words making Words meaning Reading & Writing	
Unit 04 : Grammar, (Verb, noun, pronoun, adjective, etc…)	**3 Hours**
Words meaning Reading & Writing Sentence framing	
Unit 05 : Tenses (with Continuous)	**3 Hours**
Talking about school Talking about family, friends Talking about doing something in the past, present, future Translation	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

REFERENCES

1	Diploma in Hindi (department of higher education, Delhi)

HOD

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T
2.	U23MAT202B	Transforms and Differential Equations	3	1	0	0	4	BS	60	TT
3.	U23PHY203C	Physics for Electronics and Communication Engineering	2	0	2	0	3	BS	60	TL
4.	U23EGR207	Engineering Graphics	3	0	0	0	3	ES	45	T
5.	U23EC201	Electronic Devices and Circuits	3	0	0	0	3	PC	45	T
6.	U23CPR205	Programming in C	3	0	0	0	3	ES	45	T
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
9.	U23CPL212	C Programming Laboratory	0	0	2	0	1	ES	30	L
10.	U23EC202	Electronic Devices and Circuits Laboratory	0	0	2	0	1	PC	30	L
Total Credits							21			
Optional Language Courses**										
11.	U23OL1201	French-II	1	0	0	0	1	OL	15	T
12.	U23OL1202	German-II							15	T
13.	U23OL1203	Japanese-II							15	T
14.	U23OL1204	Korean-II							15	T
15.	U23OL1205	Hindi-II							15	T

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory,TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project

**Students may opt for foreign languages viz., German/French/Japanese/Korean/Hindi with additional one credit (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	Chairperson, ECE BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.R.S.Sabeenian	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:-
HOD/ Electronics and Communication Engineering, Second Semester B.E.ECE, Students and Staff, COE

U23ENG201A	Technical English (Common to ADS, AIML, BME, CSD, CSE, CIVIL, ECE, EEE, MCT, FT, IT, EXE, EFE Branches)	L	T	P	J	C
		2	0	0	0	2

Course Outcomes

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

CO1:	Frame sentences correctly, both in written and spoken forms of language with accuracy and fluency
CO2:	Develop effective reading skills and reinforce language skills required for using grammar and building vocabulary
CO3:	Organise ideas and supporting arguments logically
CO4:	Develop skills for writing conversations, proposals, reports and transcoding
CO5:	Read for understanding and interpreting information and to utilise information accordingly

Pre-requisite:

- Knowledge and Understanding of Grammar
- Fundamental Language Skills (LSRW)

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	3	2	3	3	3	3	3	3	3	3	3
CO2	2	2	2	3	2	3	3	3	3	3	3	3	3	3
CO3	3	2	2	3	2	3	3	3	3	3	3	3	3	3
CO4	3	3	2	3	2	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	2	3	3	3	3	3	3	3	3	3

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7) Assignment/seminar/Quiz (5)	Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01: **6 Hours**

- Comparative adjectives
- Recommendations
- Guided writing – Conversation in workplace context
- Reading passages for specific information transfer

Unit 02:	6 Hours
• Prepositions, adverbs • Note making • Reading passage with multiple choice questions, reading for gist and reading for specific information	
Unit 03:	**6 Hours**
• Collocations, direct and indirect speech • Memo • Proposal: establishing a lab, introducing a subject in the curriculum, training programme for students • Short reading passage: gap-filling exercise related to grammar	
Unit 04:	**6 Hours**
• Cause and effect • Technical report writing – feasibility report, accident report, survey report • Short reading passages for sentence matching exercises, picking out specific information in a short text	
Unit 05:	**6 Hours**
• Active, passive and impersonal passive voices • Transcoding – bar chart, pie chart, tabular column, graph, flow chart	

Theory: 30 Hrs	Tutorial: --	Practical: -	Project:--	Total Hours: 30 Hrs

TEXT BOOKS

1.	Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016
2.	**Extensive Reading** 1. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons 2. Discover the Diamond in You – Arindham Chaudhari – Vikas Publishing House Pvt. Ltd.

REFERENCES

1.	Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
2.	A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.

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SEMESTER - II	TRANSFORMS AND DIFFERENTIAL EQUATIONS (Common to EEE, ECE, BME, EFE and EXE)	L	T	P	J	C
U23MAT202B		3	1	0	0	4

Course Outcomes

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

CO1:	apply the classical methods to solve linear ordinary differential equations with constant coefficients.
CO2:	apply the Laplace transforms technique and its properties to solve ordinary differential equations.
CO3:	express a periodic signal as an infinite sum of sine and cosine wave components using Fourier series.
CO4:	apply the Fourier transform techniques to convert the signal in terms of the frequencies of the waves.
CO5:	find the general and singular solutions of linear and nonlinear partial differential equations.

Pre-requisites:

- Fundamentals of elementary algebra
- Fundamentals of calculus
- Fundamentals of trigonometry
- Fundamentals of geometry

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1 (EEE,ECE EFE, EXE)	PSO2 (EEE, BME & EFE)	PSO3 (BME)
CO1	3	3	3	3	2							2	3	3	1
CO2	3	3	3	3	2							2	3	3	1
CO3	3	3	3	3	2							2	3	3	1
CO4	3	3	3	3	2							2	3	3	1
CO5	3	3	3	3	2							2	3	3	1

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01	ORDINARY DIFFERENTIAL EQUATIONS	12 Hours

Higher order linear ordinary differential equations with constant coefficients – Cauchy's and Legendre's linear ordinary differential equations – Method of variation of parameters.

Unit 02	LAPLACE TRANSFORMS	12 Hours
Laplace transform: Conditions for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse function – Initial and final value theorems – Transform of periodic functions. **Inverse Laplace transform:** Standard results – Statement of convolution theorem and its applications – Solution of second order linear ordinary differential equations with constant coefficients using Laplace transform.		
Unit 03	**FOURIER SERIES**	**12 Hours**
General Fourier series – Dirichlet's conditions – Change of intervals – Odd and even functions – Half range sine and cosine series – Root mean square – Parseval's identity – Harmonic analysis.		
Unit 04	**FOURIER TRANSFORMS**	**12 Hours**
Statement of Fourier integral theorem – Infinite Complex Fourier transform pair and their Properties – Infinite Fourier sine and cosine transforms pair and their properties –Transforms of simple functions – Parseval's identity.		
Unit 05	**PARTIAL DIFFERENTIAL EQUATIONS**	**12 Hours**
Formation of partial differential equations – Lagrange's partial differential equation – Clairaut's form of partial differential equations – Second order linear partial differential equation with constant coefficients.		

Theory: 45 Hours	Tutorial: 15 Hours	Practical: -	Project: -	Total Hours: 60 Hours

TEXT BOOKS:

1. T. Veerarajan, "Transforms and Partial Differential Equations", McGraw Hill Publishers, 3rd Edition, 2016.
2. T. Veerarajan, "Engineering Mathematics for Semesters I & II", McGraw Hill Publishers, 1st Edition, 2019.

REFERENCE BOOKS:

1. E. Kreyszig, "Advanced Engineering Mathematics", Wiley Publishers, 10th Edition, Reprint, 2017.
2. C. Prasad and R. Garg, "Advanced Engineering Mathematics", Khanna Publishers, 1st Edition, 2018.
3. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44th Edition, 2018.

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BoS Date: 08. 07. 2023	HoD / Mathematics

U23PHY203C	PHYSICS FOR ELECTRONICS AND COMMUNICATION ENGINEERING	L	T	P	J	C
		2	0	2	0	3

Course Outcomes

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

CO1:	Deduce Maxwell's equations using the fundamentals of electrostatics.
CO2:	Analyse the polarization mechanisms in dielectrics.
CO3:	Illustrate the divergence and curl of the magnetic field.
CO4:	Distinguish the types of magnetic materials.
CO5:	Evaluate the novel properties of shape memory alloys and nanomaterials.

Pre-requisite:

Basic Knowledge of electricity and magnetism

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO2	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO3	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO4	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO5	3	2	-	-	-	2	2	-	-	2	-	1	-	2

Course Assessment methods

Direct		Indirect
CIE test I (10) - Theory CIE test II (10) - Theory CIE test III (10) - Theory CIE test IV (15) - Laboratory	Assignment / Quiz/ Seminar (5) Total CIE: 50 marks Semester End Examination: 50 marks [SEE- Theory (25 marks), Lab (25 marks)]	Course end survey

Unit 01: ELECTROSTATICS — **6 Hours**

Electrostatics - Basic properties of electric charge - Coulomb's Law - Electric field - Electric field intensity - Field due to a point charge and system of charges - Electric lines of force and its properties - Electric flux – Gauss's law – Applications of Gauss's law – Field due to an infinitely

long straight charged wire – Field due to two parallel charged sheets – Field due to uniformly charged spherical shell – Electric potential - Relation between electric field and potential - Divergence and Curl of E.

Unit 02: DIELECTRIC MATERIALS	6 Hours
Basic definitions - Electric dipole - Electric dipole moment - Electric displacement vector - Electrical susceptibility - Dielectric constant - Dielectric polarization - Electronic, ionic, orientation and space charge polarization - Frequency and temperature dependence of polarization - Internal field - Clausius-Mosotti relation (no derivation) - Dielectric loss - Dielectric breakdown - Uses of dielectric materials (capacitor and transformer).	

Unit 03: MAGNETOSTATICS	6 Hours
Magnetic effect of current - Magnetic fields - Maxwell's right-hand cork screw rule -Biot Savart law - Magnetic induction due to infinitely long straight conductor carrying current - Magnetic induction along the axis of a circular coil carrying current - Ampere's circuital law - Right-hand palm rule - Applications of Ampere's circuital law – Magnetic induction due to a long solenoid carrying current - Magnetic Lorentz force – Force experienced by a current carrying conductor in a magnetic field - Fleming's left-hand rule - Divergence and curl of B - Comparison of magnetostatics and electrostatics.	

Unit 04: MAGNETIC MATERIALS	6 Hours
Basic definitions - Magnetic moment - Magnetic field - Magnetic field intensity - Magnetic permeability - Magnetization - Intensity of magnetization - Magnetic susceptibility - Types of magnetic materials - Dia, Para and Ferromagnetic materials - Domain theory of ferromagnetism - Origin of domains - Ferrites - Structure, properties and applications - hysteresis - Hard and soft magnetic materials.	

Unit 05: NEW ENGINEERING MATERIALS	6 Hours
Shape memory alloys (SMA) - Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA - Nanoscience and Nanotechnology - Significance of nanoscale - Different types of nanostructures (0-D, 1-D, 2-D and 3-D) - Fabrication of nanomaterials - Ball milling and Chemical vapour deposition technique (CVD) - Carbon nanotubes – Structure, properties and applications - Fabrication - Pulsed laser deposition method.	

Theory: 30 Hrs	Tutorial: –	Practical: 30 Hrs	Project: --	Total Hours: 60 Hrs

TEXTBOOKS

1. M.N. Avadhanulu, P.G. Kshirsagar, "A Textbook of Engineering Physics", S. Chand & Company Ltd, New Delhi 2014.
2. B. K. Pandey and S. Chaturvedi, "Engineering Physics", Cengage Learning India Pvt. Ltd., Delhi, 2021.

REFERENCES

1.	V. Raghavan, "Materials Science and Engineering: A First Course" Prentice Hall India Learning Private Limited, 6th Edison, 2015.
2.	Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill (Indian Edition), 2017.
3.	M. Arumugam, "Materials Science", Anuradha Publications, Kumbakonam, 2006.
4.	William D. Callister Jr., David G. Rethwisch, "Callister's Materials Science and Engineering", 10th Edition, Global Edition 2019.
5.	R. Wolfson, "Essential University Physics", Volume 1 & 2. Pearson Education (Indian Edition), 2009.

LIST OF EXPERIMENTS		30 Hours
1.	Determination of the thickness of a thin wire by forming interference fringes using air wedge apparatus.	
2.	Determination of velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer.	
3.	Determination of the thermal conductivity of a bad conductor using Lee's Disc apparatus.	
4.	Determination of specific resistance of a given wire using Carey Foster's bridge.	
5.	Determination of the wavelength of a diode laser.	
6.	Determination of particle size of lycopodium powder using diode laser.	
7.	Determination of acceptance angle and numerical aperture of an optical fibre using diode laser.	
8.	Determination of hysteresis loss using B-H curve method.	
9.	Determination of coefficient of viscosity of liquid by Poiseuille's method.	
10.	Determination of band gap of the given semiconductor diode.	

27.1.2025

Dr. C. Shanthi
HOD / Science

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27.1.2025

Dr. M. Renuga
BoS – Chairperson,
Science and Humanities

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Professor & Head,
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U23EGR207	ENGINEERING GRAPHICS (Common to ADS, IT, BME, CSE, ECE, and FT branches)	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Construct –Ellipse, Parabola, Hyperbola, Cycloids and Involutes.
CO2:	Draw the projection of Point, Line and Plane surfaces.
CO3:	Draw the projection of simple solids by rotating object method.
CO4:	Develop the section of simple solids and lateral surface of truncated solids.
CO5:	Draw the isometric view to orthographic projection.

Pre-requisite: Nil

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	1							3		2			1	
CO2					3			2		2		2		2
CO3					3			2		2		2	1	2
CO4					3			2		2		2	1	2
CO5			2					2		2		2	1	

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

CONCEPTS AND CONVENTIONS - (Not for Examination). Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning. **Unit 01: PLANE CURVES - (Manual drafting).** Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction	**9 Hours**

of cycloid – construction of Involute of circle – Drawing of tangents and normal to the above curves.	
Unit 02: PROJECTION OF POINTS, LINES AND PLANE SURFACES (CAD software). 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. Projection of planes (polygonal and circular surfaces) inclined to one of the principal plane by rotating object method.	**9 Hours**
Unit 03: PROJECTION OF SOLIDS (CAD software). Projection of simple solids - prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.	**9 Hours**
Unit 04: PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES. (CAD software). Section of solids in simple vertical position when the cutting plane is inclined to one of the principal planes and perpendicular to the other – (obtaining true shape of section is not required). Development of lateral surfaces of truncated solids – Prisms, pyramids cylinders and cones.	**9 Hours**
Unit 05: ISOMETRIC TO ORTHOGRAPHICS PROJECTION- (Manual drafting). Representation of three dimensional objects – General Principles - Need for importance of multiple views – First angle projection – layout of views – Conversion of isometric view to orthographic views. Practicing three dimensional modelling of simple objects using CAD Software **(Not for examination)**	**9 Hours**

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.
2.	Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
3.	Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015
4.	P.Suresh., "Engineering Graphics and Drawing", Sonaversity, Sona College of Technology, Salem, Revised edition, 2012.

REFERENCES	
1.	BasantAgarwal and Agarwal C.M.,"Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2.	Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27thEdition, 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.	Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
6.	Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.

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U23EC201	ELECTRONIC DEVICES AND CIRCUITS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Understand the concepts of power supply and wave shaping circuits
CO2:	Illustrate the transistor biasing and its stabilization.
CO3:	Analyze the construction and characteristics of FETs and MOSFETs.
CO4:	Analyze the mid-frequency operation of BJT amplifier circuits.
CO5:	Examine the frequency response characteristics of amplifiers.

Pre-requisite:

Fundamental of Electrical and Electronics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	3	2			2	1	2	3	3
CO2	3	3	3	3	3	3	2			2	1	2	3	3
CO3	3	3	3	3	3	3	2			2	1	2	3	3
CO4	3	3	3	3	3	3	2			2	1	2	3	3
CO5	3	3	3	3	3	3	2			2	1	2	3	3

Course Assessment methods

27/1/25

Direct			Indirect
CIE test I	(9)	Assignment/seminar/Quiz (5)	Course end survey
CIE test II	(9)	Total CIE: 40 marks	
CIE test III	(10)	Semester End Examination: 60 marks	
Objectives Test	(7)		

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Unit 01: POWER SUPPLY AND WAVE SHAPING CIRCUITS — **9 Hours**

Diode Rectifiers - Half-wave, full-wave and bridge rectifiers with resistive load- Filters C, L, LC and CLC – Voltage Regulators using 78XX -Diode Clippers – Series – Shunt – Diode Clamper – Positive – Negative – RC Differentiator – RC Integrator.

Unit 02: TRANSISTOR BIASING — **9 Hours**

BJT – Need for biasing -Fixed bias circuit, Load line and quiescent point - Stability factors – Different types of biasing circuits - Method of stabilizing the Q point - Advantage of Self bias (voltage divider bias) over other types of biasing- self bias as a constant current circuit	
Unit 03: FIELD EFFECT TRANSISTORS	**9 Hours**
JFETs (P-channel, N-channel) Construction – Drain and Transfer characteristics -Current Equations - Pinch off voltage and its significance- MOSFET (Enhancement-mode MOSFET, depletion-mode MOSFET) Construction - Drain and Transfer characteristics - Threshold voltage - Channel length modulation, Comparison of MOSFET with JFET- Basics of CMOS - Merits and Demerits – Application - FINFET	
Unit 04: MID-BAND ANALYSIS OF SMALL SIGNAL AMPLIFIERS	**9 Hours**
Method of drawing small-signal equivalent circuit-CE, CB and CC (h Parameter) amplifiers - Comparison –Analysis of CE Configuration using Approximate model - Miller's theorem - Methods of increasing input impedance using Darlington connection and bootstrapping.	
Unit 05: FREQUENCY RESPONSE OF AMPLIFIERS	**9 Hours**
General shape of frequency response of amplifiers - Definition of cut-off frequencies and bandwidth - Low frequency analysis of amplifiers to obtain lower cut-off frequency - Hybrid equivalent circuit of BJTs - High frequency analysis of BJT amplifiers to obtain upper cut-off frequency – Gain Bandwidth Product.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	Salivahanan S. and Sureshkumar N., "Electronic Devices and Circuits", 5th Edition, McGraw-Hill, 2022
2.	David A. Bell, "Electronic devices and circuits" 5th edition, Prentice-Hall, 2018

REFERENCES

1.	Charles K. Alexander and Matthew N. O. Sadiku, "Fundamentals of Electric Circuits", McGraw Hill; Standard Edition, 2022
2.	Varsha Agrawal Anil K. Maini, "Electronic Devices and Circuits", 2 Edition, Wiley, 2019
3.	Adel S. Sedra (Author), Kenneth C. Smith (Author), Arun N. Chandorkar, "Microelectronic Circuits: Theory and Applications", Second Hand & Used Book (S), Oxford University Press,2018
4.	Donald A. Neamen, "Electronic Circuit Analysis and Design", Tata McGraw Hill, 2nd Edition,2017.
5.	Robert L. Boylestad Electronic Devices and Circuit Theory, 11e 11th Edition, Kindle Edition,2014

27/1/25

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U23EC202	ELECTRONIC DEVICES AND CIRCUITS LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO6:	Design of Rectifiers, wave shaping circuits, Transistor biasing
CO7:	Examine the characteristics of BJT, JFET and MOSFET.
CO8:	Analyze the frequency response of BJT amplifiers.

Pre-requisite:

Fundamental of Electrical and Electronics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	3	2	2	2	2	2	3	3	3	3
CO2	3	3	2	3	3	2	2	2	2	2	3	3	3	3
CO3	3	3	2	3	3	2	2	2	2	2	3	3	3	3

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz 1 (5) CIE test II (15) Quiz 2 (5)	RTPS (10) Record (10) Total CIE: **60 marks** Semester End Examination: **40 marks**	Course end survey

27/1/25

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List of Experiments

1. Design and construct the half-wave rectifier with and without a filter, and plot its input and output waveforms.
2. Design and construct the Bridge rectifier with and without a filter, and plot its input and output waveforms.
3. Construct Positive Series Clipper and Positive Clamper and obtain its waveforms.
4. Construct Differentiator and Integrator circuit by using passive element and obtain the output waveform for the input signal i) Sine ii) Square.

5. Design, construct, and test a Voltage Regulator with a Zener Diode and plot its load and line regulation.
6. Design and construct a 5-volt fixed-voltage Power supply using a linear regulator IC.
7. Construct a Fixed bias circuit and calculate IB, IC, and VCE.
8. Construct a Voltage divider bias and calculate IB, IC, and VCE.
9. Verify the Drain and Transfer characteristics of JFETs.
10. Verify the Drain and Transfer characteristics of MOSFETs.
11. Design and construct MOSFETs as a switch.
12. Construct a CE Amplifier using Voltage divider bias and obtain its frequency response.

Theory: 0	Tutorial: 0	Practical:30 Hrs	Project: 0	Total Hours: 30 Hrs

27/1/25

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U23CPR205	PROGRAMMING IN C (Common to ADS,IT,CSE,CSE(AIML),CSD,ECE,EFE and EXE Branches)	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Write simple C programs using console input and output functions
CO2:	Write C programs using arrays, decision making and looping statements
CO3:	Design and develop simple application using functions and pointers.
CO4:	Design and develop real-time applications using structures and unions
CO5:	Design and develop real-time applications using file operation

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	3	2	2	2	-	2	-	2	2	3	3	2	2
CO2	2	2	3	2	2	1	-	2	-	2	2	3	2	2	2
CO3	2	3	3	2	2	1	-	2	-	2	2	3	3	2	2
CO4	2	3	3	2	2	1	-	2	-	2	1	3	3	2	2
CO5	2	3	3	2	2	2	-	2	-	2	2	3	3	2	2

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01: C PROGRAMMING BASICS — **9 Hours**

Structure of a C program - C Character set, Identifies and Keywords, Data Types, Declarations, Expressions, Statements and Symbolic constants, Operators – Arithmetic Operators – Unary operators – Relational and Logical Operators – Assignment operators – Conditional operators. Unformatted and formatted Input/Output functions, pre-processor directives and storage classes.

Unit 02: CONTROL STATEMENTS, ARRAYS AND STRING — **9 Hours**

Conditional statements, Unconditional statements, branching and looping statements - Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

Unit 03: FUNCTIONS AND POINTERS — **9 Hours**

Function – Library functions and user-defined functions – Function prototypes and function definitions – Call by value – Call by reference – Recursion – Pointers - Definition – Initialization – Pointers arithmetic – Pointers and

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arrays – Pointers and Functions - Dynamic memory Allocation - Example Programs.

Unit 04: STRUCTURES AND UNIONS	**9 Hours**
Need for structure data type – structure definition – Structure declaration – Structure within a structure – Passing structures to functions – Array of structures – Pointers to structures – Union - Programs using structures and Unions	

Unit 05: FILE MANIPULATIONS	**9 Hours**
Files-File operations- Binary files and text files – Types of File processing-Sequential access -Random Access File - Command line arguments.	

Theory: 45 Hrs	**Tutorial: 0**	**Practical: 0**	**Project:0**		**Total Hours: 45 Hrs**

	TEXT BOOKS
1.	Deitel and Deitel, "C How to Program", Pearson Education, New Delhi, 2011.
2.	Yashavant P. Kanetkar. "Let Us C", BPB Publications, 14th edition, 2016.
	REFERENCES
1.	Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006.
2.	Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006.
3.	Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
4.	E. Balagurusamy, "Programming in ANSI C", seventh edition, Tata McGraw Hill, 2016.

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U23CPL212	C PROGRAMMING LABORATORY (Common to ADS,IT,CSE,CSE(AIML),CSD,ECE,EFE and EXE Branches)	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1	Design and develop simple programs using branching, looping statements
CO2:	Develop programs using functions, arrays, structures and string handling
CO3:	Write programs using pointers and dynamic memory allocation and file handling

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	3	2	2	2	-	-	-	-	-	-	1	2	2
CO2	2	2	3	2	2	1	-	-	-	-	-	-	1	2	2
CO3	2	3	3	2	2	1	-	-	-	-	-	-	1	2	2

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz 1- (5) CIE test II (15) Quiz 2- (5)	RTPS (10) Record (10) Total CIE: **60 marks** Semester End Examination: **40 marks**	Course end survey

List of Experiments:

1. Programs using Input, Output and assignment statements.
2. Programs using Branching statements
3. Programs using Looping statements
4. Programs using Functions
5. Programs using Arrays
6. Programs using Structures
7. Programs using Strings
8. Programs using Pointers (both data pointers and function pointers)
9. Programs using dynamic memory allocation
10. Programs using Recursion
11. Programs using Files

Theory: 0	Tutorial: 0	Practical: 30Hrs	Project:0	Total Hours: 30 Hrs

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U23TAM201	தமிழரும் தொழில்நுட்பமும்	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Describe the weaving and ceramic technology
CO2:	Explain the design and construction technology
CO3:	Analyse the manufacturing technology
CO4:	Describe the agriculture and irrigation technology
CO5:	Explain the Scientific Tamil and Tamil Computing

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: WEAVING AND CERAMIC TECHNOLOGY — **3 Hours**

அலகு I நெசவு மற்றும் பானைத் தொழில்நுட்பம்: 3

சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் பாண்டங்களில் கீறல் குறியீடுகள்.

Unit 02: DESIGN AND CONSTRUCTION TECHNOLOGY — **3 Hours**

அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்: 3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு– சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் – மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ–சாரோசெனிக் கட்டிடக் கலை.

Unit 03: MANUFACTURING TECHNOLOGY — **3 Hours**

அலகு III உற்பத்தித் தொழில் நுட்பம்: 3

கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

Unit 04: AGRICULTURE AND IRRIGATION TECHNOLOGY — **3 Hours**

அலகு IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்: 3

அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்.

Unit 05: SCIENTIFIC TAMIL & TAMIL COMPUTING — **3 Hours**

அலகு V அறிவியல் தமிழ் மற்றும் கணித்தமிழ்: 3

அறிவியல் தமிழின் வளர்ச்சி -கணித்தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS	
1.	தமிழக வரலாறு –மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2.	கணினித் தமிழ் –முனைவர் இல. சுந்தரம். (விகடன் பிரகரம்). கீழடி –வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) பொருநை –ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

REFERENCES	
3.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
4.	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
5.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
6.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
7.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8.	Studies in the History of India with Special Reference to Tamil Nadu (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.Ramakrishna) (Published by: RMRL) – Reference Book.

HOD

Dr. M.RENUGA,
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Sona College of Technology,
SALEM - 636 005.

U23TAM201	TAMILS AND TECHNOLOGY	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Describe the weaving and ceramic technology
CO2:	Explain the design and construction technology
CO3:	Analyse the manufacturing technology
CO4:	Describe the agriculture and irrigation technology
CO5:	Explain the Scientific Tamil and Tamil Computing

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: WEAVING AND CERAMIC TECHNOLOGY — **3 Hours**

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

Unit 02: DESIGN AND CONSTRUCTION TECHNOLOGY — **3 Hours**

Designing and Structural construction House & Designs in household materials during Sangam Age - 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 Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

Unit 03: MANUFACTURING TECHNOLOGY — **3 Hours**

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described inSilappathikaram.

Unit 04: AGRICULTURE AND IRRIGATION TECHNOLOGY — **3 Hours**

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu 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

Unit 05: SCIENTIFIC TAMIL & TAMIL COMPUTING — **3 Hours**

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

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1. தமிழக வரலாறு –மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் –முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
   கீழடி –வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
   பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

REFERENCES	
1.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2.	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
3.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
5.	Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
6.	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
7.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8.	Journey of Civilization Indus to Vaigai (R.Ramakrishna) (Published by: RMRL) – Reference Book.

HOD

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U23GE201	BASIC APTITUDE-II (Common to All Departments)	L	T	P	J	C
		2	0	0	0	0

Course Outcomes

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

CO1:	Solve the problems in Percentage, Conversion of Percentage to Ratio and Ratio into Percentage and work on verbal aptitude questions
CO2:	Elucidate the problems in Profit and loss and percentage of profit and loss. Choose appropriate sentence fillers and Idioms and phrase
CO3:	Crack the problems involving Geometry, Area, Perimeter/Circumference, Surface area and Volume. Comprehend the given passages for Reading Comprehension activity and answer the questions correctly.
CO4:	Deduce the problems involving Trigonometry and exhibit good expertise in detecting errors in the given sentences.
CO5:	Interpret the problems on Ages & logarithm and work on logical reasoning and demonstrate good vocabulary skill by spotting errors.

Pre-requisite:

- Basic English language and Grammar knowledge
- Knowledge in Basic Mathematics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO 11	PO12
CO1	3	3	3	2	1	1	1	3	3	3	2	3
CO2	3	3	3	2	1	1	1	3	3	3	2	3
CO3	3	3	3	2	1	1	1	3	3	3	2	3
CO4	3	3	3	2	1	1	1	3	3	3	2	3
CO5	3	3	3	2	1	1	1	3	3	3	2	3

Course Assessment methods

Direct		Indirect
CIE test I (30) - Theory CIE test II (30) - Theory CIE test III (40) – Theory	Total CIE: 100 marks Semester End Examination – NIL	Course end survey

Unit 01	6 Hours
Percentage: Conversion of a Percentage into a Fraction – Conversion of a Percentage into a Ratio – Conversion of a Ratio into a Percentage - Percentage Change – Successive percentage – Problems **Verbal Aptitude:** Jumbled sentences & Reconstructions of sentences (PQRS)	
Unit 02	**6 Hours**
Profit Loss: Types of prices – Profit – Loss – Percentage of Profit and Loss - Common Gain or Loss – Selling Price and Cost Price Equality – Successive Profit and Loss – Problems **Verbal Aptitude:** Sentence fillers two words & Idioms and phrase	
Unit 03	**6 Hours**
Geometry: Angles – Complementary and Supplementary angles – Lines – Triangle – Types of triangles – Properties of Triangles – Problems **Area, Perimeter / Circumference:** Triangles - Rectangles and Squares – Parallelogram, Rhombus and Trapezium – Circles – Problems **Surface area, curved surface area & Volume:** Cuboid – Cube – Right circular cylinder – Right circular cone – Sphere – Hemisphere– Problems **Verbal Aptitude:** Reading comprehension.	
Unit 04	**6 Hours**
Trigonometry: Value of Trigonometry ratios for particular values – Sign of Trigonometrical ratios – Trigonometrical ratios for sum or difference of angles Problems **Verbal Aptitude:** Spotting errors	
Unit 05	**6 Hours**
Averages – Problems on ages – Logarithm **- Logical Reasoning:** Alpha Series – Venn diagram – Problems **Verbal Aptitude**: Writing captions for given pictures.	

Theory: 30 Hrs	Tutorial: 0	Practical: 0	Project: 0	Total Hours: 30 Hrs

TEXT BOOKS

1.	S.Chand and Dr.R.S.Aggarwal, "Quantitative Aptitude for competitive examinations", S Chand and Company Limited 2019.
2.	Nishit K.Sinha, "Logical Reasoning and Data Interpretation", Pearson 2021.

S. Anita 6/02/2024

Dr.S.Anita
Professor & Head
Department of Training

Dr. S. ANITA
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SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005.

U23OL1201	French - II	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Accept and refuse of an invitation, give some instruction of do's and don'ts, converse in commercial centres, write an invitation
CO2:	Describe a city, locate a place in a city, ask further details, describe one's hometown
CO3:	Talk about things around us, recite a past event, identify sign boards, express agree and disagree, express obligation and prohibition, sell an object in online
CO4:	Talk about one's goals, express one's feelings, write a list of things to do, express an opinion, talk about weather, draft a mail response
CO5:	Express one's interest and wish, describe a pet animal, express one's aversions, encourage others, write to ask for a help, narrate a past event, write a biography

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
Hr 2: City shopping and services, conjugation: payer, manger and acheter, negative sentence Hr 4: Imperative sentence, food and beverages, utensils, cutleries, corckeries Hr 6: Quantitative articles, quantities, pronoun 'en', express appreciation, write an invitation	
Unit 02:	**3 Hours**
Hr 8: City and localities, Conjugation: prendre, adjectives of place, pronoun 'y' Hr 10: Transport, leisure activities, preposition of place, degrees of comparison Hr 12: Asking information about a new place, describe a city	
Unit 03:	**3 Hours**
Hr 14: Things in a store, conjugation : faire, imparfait 2, passé composé Hr 16: Things in a repairing shop, computer, relative pronouns: que and qui Hr 18: Imperative negative, express obligation and interdiction, online sale and response	
Unit 04:	**3 Hours**
Hr 20: Professions, conjugation: croire, voir, recent past tense Hr 22: Traveling formalities, expressing about health condition, future tense Hr 24: Pronoun COD, talk about weather condition, write about one's plans and projections	
Unit 05:	**3 Hours**
Hr 26: Citizenship and solidarity, conjugation: connaitre and savoir, depuis vs pendant Hr 28: Imparfait vs passé composé, nature and environment, indirect pronouns COI Hr 30: Animals, conditional, talk on supporting others, write a biography	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1.	The course faculty will provide relevant audios, videos, handouts and notes.
2.	Books : Saison (Méthode de français, cachier d'activités)
3.	Reference books : La conjugaison, Dondon, Echo

13/2/24.

HOD

Dr. M.RENUGA,
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SALEM - 6.

U23OL1202	German - II	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Use grammatical expressions appropriately in day-to-day conversation.
CO2:	Make them frame simple sentences /questions.
CO3:	Accentuate to start and sustain basic conversation
CO4:	Helps them articulate thoughts in German
CO5:	Identify the different forms of the verb

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
Nominative/accusative case, adjectives	
Unit 02:	**3 Hours**
Modes of transportation, orientation, giving/understanding simple directions	
Unit 03:	**3 Hours**
• Food and beverages, Modal verbs, Separable verbs	
Unit 04:	**3 Hours**
• Simple sentences using modal / separable verbs	
Unit 05:	**3 Hours**
• Articles of clothing	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1. Netzwerk A1

HOD 13/2/24

Dr. M.RENUGA,
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Department of Humanities & Languages,
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SALEM - 636 :

U23OL1203	Japanese - II	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Use verbs in polite conversation or for dissuasion and describe two different activities
CO2:	Demonstrate the application of causative verbs and those that express ability or possibility, and describe experiences
CO3:	Use plain-style expressions, those that state opinions, and verbs and adjectives that go with nouns
CO4:	Express sentences that use 'when' and 'if' and those that describe how services are given and received
CO5:	Read 126 letters of Kanji, and demonstrate adequate knowledge of the lessons learnt in Levels I and II to pass the Japanese Language Proficiency Test (JLPT) for the N5 Level

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01:	**3 Hours**
Hr 1-2: Words and verbs expressing requests / Kanji 1-10 Hr 3-4: Asking for permission; making statements to prohibit something / Kanji 11-20 Hr 5-6: Describing two activities / Kanji 21-30	
Unit 02:	**3 Hours**
Hr 7-8: Verbs that express 'I have to ...' / Kanji 31-40 Hr 9-10: Verbs which express ability or possibility / Kanji 41-50 Hr 11-12: Describing experience / Kanji 51-60	
Unit 03:	**3 Hours**
Hr 13-14: Plain-style expressions / Kanji 61-70 Hr 15-16: Expressions like 'I think that ...' / Kanji 71-80 Hr 17-18: Qualifying nouns with verbs and adjectives / Kanji 81-90	
Unit 04:	**3 Hours**
Hr 19-20: Expressions using 'When ...' / Kanji 91-100 Hr 21-22: Describing the giving and receiving of services / Kanji 101-110 Hr 23-24: Expressions using 'If ...' / Kanji 111-126	
Unit 05:	**3 Hours**
Hr 25-26: Preparing for JLPT N5 Hr 27-28: Preparing for JLPT N5 Hr 29-30: Preparing for JLPT N5	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

TEXT BOOKS

1.	The course faculty will provide handouts / notes / course material.
2.	Books on Basic Japanese language available in the college library.

13/4/24

HOD

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U23OL1204	Korean - II	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Identify time
CO2:	Identify the date and days of the week
CO3:	Explain location and places
CO4:	Explain destination
CO5:	Construct simple sentences / questions.

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: Time	3 Hours
Talking about time	
Unit 02: Date	3 Hours
Talking about dates and days of the week Talking about doing something in the past	
Unit 03: Location	**3 Hours**
Talking about location Talking about doing something at a location	
Unit 04: Direction	**3 Hours**
Talking about directions	
Unit 05: Future	**3 Hours**
Talking about doing something in the future Talking about plans for the future Talking about hope for the future	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

REFERENCES

1	Vitamin Korean - 1

13/2/24.

HOD

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SALEM - 635 005.

U23OL1205	Hindi - II	L	T	P	J	C
		1	0	0	0	1

Course Outcomes

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

CO1:	Write Tenses and Self – Introduction
CO2:	Write Hindi numbers & sentence Translations
CO3:	Read and Write comprehension question & days of the week
CO4:	Read and frame sentences (Story) & part of the body
CO5:	Communicate effectively using tenses (Conversation)

Course Assessment methods

Direct		Indirect
CIE test I (30) CIE test II (30) CIE test III (40)	Total CIE: 100 marks Semester End Examination: NIL	Course end survey

Unit 01: Tenses and Self – Introduction	3 Hours
Learning Hindi pronunciation Speaking based on Tenses (Present, past & future) Reading Writing	
Unit 02: Hindi Numbers & Sentence Translations	3 Hours
Reading Writing Letters pronunciation Meanings learning	
Unit 03: Comprehension question & Days of the week	**3 Hours**
Reading & analysing the meaning Learning	
Unit 04 : Story and Part of the body	**3 Hours**
Words meaning Reading & Writing Sentence framing	
Unit 05 : Conversation and Colours name	**3 Hours**
Conversation between a boy and Doctor Coersation between Taxi driver and Passenger	

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs

REFERENCES

1	Diploma in Hindi (department of higher education, Delhi)
2	Hindi Prachara sabha exam books (Prathamic and Madhyama)

HOD

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ECE
III

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23MAT301C	Probability and Stochastic Processes	3	1	0	0	4	BS	60	TT
2.	U23EC301	Signals and Systems	3	0	2	0	4	PC	75	TL
3.	U23EC302	Digital Electronics	3	0	2	0	4	PC	75	TL
4.	U23EC303	Analog Circuits	3	0	0	0	3	PC	45	T
5.	U23EC304	Circuit Theory	3	0	0	0	3	PC	45	T
6.	U23CS308	Data Structures	3	0	0	0	3	ES	45	T
7.	noc25-mg106	**NPTEL**: Design Thinking- A Primer	1	0	0	0	1	ES	15	T
8.	U23GE302	**Audit Course**: Environment and Climate Science	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23EC305	Analog Circuits Lab	0	0	2	0	1	PC	30	L
10.	U23CS309	Data Structures lab	0	0	2	0	1	ES	30	L
11.	U23GE301	Soft Skills and Aptitude-I	0	0	2	0	1	EEC	30	L
Total Credits							25			

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project. P-Project

Approved By

14/6/2025	20/6/25		
Chairperson, Electronics and Communication Engineering BoS	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.R.S.Sabeenian	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

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Copy to:-
HOD, Electronics and Communication Engineering, Third Semester B.E. ECE Students and Staff, COE

SEMESTER - III	PROBABILITY AND STOCHASTIC PROCESSES (ELECTRONICS AND COMMUNICATION ENGINEERING)	L	T	P	J	C
U23MAT301C		3	1	0	0	4

COURSE OUTCOMES

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

CO1:	apply the concepts of probability, random variable and their properties to generate the moments.
CO2:	fit the suitable distribution and its properties to the real world problems and interpret the results.
CO3:	apply the concepts of joint probability distribution and its properties to find the covariance and transformation of random variables.
CO4:	make a probabilistic model for characterizing a random signal.
CO5:	find the expected frequency of the random process and analyze the response of random inputs to linear time invariant systems.

Pre-requisites:

- Fundamentals of elementary algebra
- Fundamentals of calculus
- Fundamentals of trigonometry
- Fundamentals of geometry

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3							2	2	
CO2	3	3	3	3	3							2	2	
CO3	3	3	3	3	3							2	2	
CO4	3	3	3	3	3							2	2	
CO5	3	3	3	3	3							2	2	

COURSE ASSESSMENT METHODS

DIRECT		INDIRECT
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/Quiz/Seminar (5) Total CIE: 40 marks Semester End Examination: 60marks	**Course end survey**

Unit 01 ONE DIMENSIONAL RANDOM VARIABLE — 12 Hours

One dimensional random variable – Discrete random variable – Distribution function of the discrete random variable –Probability mass function– Properties– Continuous random variable– Distribution function of the continuous random variable – Probability density function –Properties –Moments – Mathematical expectations– Moment generating function and its properties.

Unit 02 STANDARD DISTRIBUTIONS — 12 Hours

Discrete distributions- Binomial distributions- Additive property, moment generating function, mean, variance and standard deviation of Binomial distribution- Poisson distribution - Additive property, moment generating function, mean, variance and standard deviation of Poisson distribution - Poisson distribution as limiting form of Binomial distribution (Statement only)- Geometric distribution- Memoryless property, moment generating function, mean, variance and standard deviation of Geometric distribution- Continuous distribution- Uniform distribution- moment generating function, mean, variance and standard deviation of Uniform distribution- Exponential distribution- Memoryless property, moment generating function, mean, variance and standard deviation of exponential distribution- Normal distribution- Additive property, moment generating function, mean, variance and standard deviation of Normal distribution (without derivation)- Normal distribution as limiting form of Binomial distribution (Statement only)-Problems based on real time applications in discrete and continuous distributions – Function of one dimensional random variable.

Unit 03	TWO DIMENSIONAL RANDOM VARIABLES AND THEIR TRANSFORMATIONS	12 Hours
Two dimensional discrete random variables – Joint probability distributions of discrete random variables- Marginal and conditional probability distributions- Two dimensional continuous random variables- Joint probability density function- Joint probability distribution function for continuous two dimensional random variables- Marginal and conditional density functions- Covariance- Correlation – Transformation of two dimensional random variables.		
Unit 04	**RANDOM PROCESSES**	**12 Hours**
Classification – First order, second order, strictly stationary, wide sense and ergodic processes – Poisson process.		
Unit 05	**SPECTRAL DENSITIES AND LINEAR SYSTEMS WITH RANDOM INPUTS**	**12 Hours**
Auto correlation functions, Cross correlation functions, Power spectral density functions, Wiener – Khinchine theorem*, Cross spectral density functions and their Properties* - Linear time invariant system – System transfer function – Linear systems with random inputs and its properties* - Auto correlation and cross correlation functions of input and output. (*Statement only for all properties and theorems)		

Theory: **45 Hours**	Tutorial: **15 Hours**	Practical:--	Project:--	Total: **60 Hours**

TEXT BOOKS:

1.	T. Veerarajan, "Probability, Statistics and Random Processes with Queuing Theory and Queuing Networks", McGraw Hill Publishers, 4th Edition, 7th Reprint, 2018.
2.	P. Z. Peebles Jr., "Probability, Random Variables and Random Signal Principles", McGraw Hill Publishers, 4th Edition, 37th Reprint, 2016.

REFERENCE BOOKS:

1.	S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons Publishers, 12th Revised Edition, 2020.
2.	R. A. Johnson and C. B. Gupta, "Miller and Freund's, Probability and Statistics for Engineers", Pearson Publishers, 9th Edition, 2018.
3.	S. Ross, "A First Course in Probability", Pearson Publishers, 9th Edition, 2019.
4.	S. Ghahramani, "Fundamentals of Probability", CRC Press Publishers, 5th Edition, 2024.

B.E/B. TECH REGULATIONS 2023	HEAD OF THE DEPARTMENT OF MATHEMATICS
S&H BoS DATE:22-06-2024	

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U23EC301	SIGNALS AND SYSTEMS	L	T	P	J	C
		3	0	2	0	4

Course Outcomes

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

CO1:	Classify the signals as continuous time and discrete time signals and classify systems. based on their properties
CO2:	Determine the response of LTI system using convolution Integral for system and convolution sum for DT CT system
CO3:	Apply Fourier series and Fourier Transform for periodic Signals
CO4:	Analyze CT system using Laplace transform and realize the structure for CT system
CO5:	Analyze DT system using Z transform and realize the structure for DT system

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2	1	-	1	-	1	-	-	1	3	3
CO2	3	3	1	2	1	-	1	-	1	-	-	1	3	3
CO3	3	3	1	2	1	-	1	-	1	-	-	1	3	3
CO4	3	3	2	2	1	-	1	-	1	-	-	1	3	3
CO5	3	3	2	2	1	-	1	-	1	-	-	1	3	3

Course Assessment methods

Direct		Indirect
CIE test I (10) CIE test II (10) CIE test III (10) CIE test IV(15)(Laboratory)	Assignment/ Quiz/Seminar (5) Total CIE: 50 marks Semester End Examination (50) [SEE-Theory(35 marks), Lab(15 marks)]	Course end survey

Unit 01 : CLASSIFICATION OF SIGNALS AND SYSTEMS — **9 Hours**

Continuous-Time and Discrete-Time signals–The Unit Impulse Unit Step, Unit Ramp Signals and other Basic Signals – Operation of Signals -Time Shifting – Time Reversal – Amplitude Scaling – Time Scaling – Signal Addition – Multiplications – Classification of signals- Continuous-Time and Discrete-Time Systems– Basic System Properties - Systems with and Without Memory – Causality – Stability – Time Invariance – Linearity

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Unit 02 : LINEAR TIME- INVARIANT SYSTEMS	9 Hours
Continuous-Time LTI Systems: The Convolution Integral - graphical and analytical approach – Properties of Linear Time-Invariant Systems – Solution of Differential Equations. Discrete-Time LTI system: The Convolution sum-tabulation method-matrix multiplication method-graphical and analytical approach – Solution of Difference Equations.	
Unit 03: ANALYSIS OF CT SIGNALS USING FOURIER SERIES & FOURIER TRANSFORM	**9 Hours**
Fourier Series Representation (Trigonometric and Exponential) of Continuous-Time Periodic Signals – Properties of Continuous-Time Fourier Series – Representation of Aperiodic Signals: The Continuous-Time Fourier Transform – The Fourier Transform for Periodic Signals – Properties of the Continuous-Time Fourier Transform.	
Unit 04 : ANALYSIS OF SIGNALS AND SYSTEMS USING LAPLACE TRANSFORM	**9 Hours**
The Laplace Transform – The Region of Convergence for Laplace Transform– The Inverse Laplace Transform using Partial fraction– Properties of the Laplace Transform–System Function- Solution of Differential Equations using Laplace Transform and Block Diagram Representations-Direct Form I and Direct Form II.	
Unit 05 : ANALYSIS OF SIGNALS AND SYSTEMS USING Z-TRANSFORM	**9 Hours**
The Z-Transform – The Region of Convergence for the Z-Transform –The Inverse Z- Transform using Partial fraction and long division method– Properties of the Z- Transform – System Function -Solution of Difference Equations using Z Transform and Block Diagram Representations-Direct Form I and Direct Form II.	

List of Experiments **30 Hours**

1. Basic plotting of signals
   a. To study various MATLAB commands for creating two- and three-dimensional plots.
   b. Write a MATLAB program to plot the following continuous time and discrete time signals.
      i. Step Function
      ii. Impulse Function
      iii. Exponential Function
      iv. Ramp Function
      v. Sine Function

2 Time and Amplitude transformations

Write a MATLAB program to perform amplitude-scaling, time-scaling and time shifting on a given signal.

3. Convolution of given signals

Write a MATLAB program to obtain linear convolution of the given sequences.

4. Impulse response and Step response of a given system
   a. Write a MATLAB program to find the impulse response and step response of a system form its difference equation.
   b. Compute and plot the response of a given system to a given input.

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5. Fourier Series and Gibbs Phenomenon
   a. To calculate Fourier series coefficients associated with Square Wave.
   b. To Sum the first 10 terms and plot the Fourier series as a function of time.
   c. To Sum the first 50 terms and plot the Fourier series as a function of time

6. Calculating transforms using MATLAB
   a. Calculate and plot Fourier transform of a given signal.

7. Calculating transforms using MATLAB
   b. Calculate and plot Z-transform of a given signal.

8. Pole-zero diagram and ROC
   a. Write a MATLAB program to find pole-zero diagram from the given system function.

9. Frequency response of a system
   Write a MATLAB program to plot magnitude and phase response of a given system.
10. Checking linearity/non-linearity of a system using SIMULINK
   a. Build a system that amplifies a sine wave by a factor of two.
   b. Test the linearity of this system using SIMULINK.

Theory: 45 Hrs	Tutorial: --	Practical: 30 Hrs	Project: --	Total Hours: 75 Hrs

TEXT BOOKS

1.	Alan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab, "Signals and Systems", 2nd E, Prentice Hall India, 2010
2.	A.Anand Kumar, "Signals and Systems", 3rd Edition, Prentice Hall India,2013

REFERENCES

1.	M .J. Roberts, "Signals & Systems Analysis using Transform Methods & MATLAB", Tata McGraw Hill, 2007
2.	Haykin, Simon, and Barry Van Veen. "Signals and systems", John Wiley & Sons, 2007. 3. A. NagoorKani, "Signals & Systems", Tata McGraw Hill, 2010
3.	John G. Proakis, Dimitris G. Manolakis, "Digital Signal Processing, Principles, Algorithms, and Applications", 4th E, PHI, 2007
4.	Robert A. Gable, Richard A. Roberts, "Signals & Linear Systems", 3rd E, John Wiley, 1995
5.	Edward W Kamen& Bonnie's Heck, "Fundamentals of Signals and Systems", Pearson Education, 2007

Prepared By
Dr T.Shanthi

Approved By 14/06/25
Dr.R.S.Sabeenian

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U23EC302	DIGITAL ELECTRONICS	L	T	P	J	C
		3	0	2	0	4

Course Outcomes

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

CO1:	Understand logic gates, logic functions and simplify Boolean expressions.
CO2:	Develop the knowledge of combinational logic circuits
CO3:	Design of sequential logic circuits
CO4:	Implement shift registers and counters using Flip flops.
CO5:	Establish a strong understanding of PLD and model the logic circuits using Verilog HDL.

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	1					1	1	3	3
CO2	3	3	2	2	1	1					1	1	3	3
CO3	3	3	2	2	1	1					1	1	3	3
CO4	3	3	2	2	1	1					1	1	3	3
CO5	3	3	2	2	1	1					1	1	3	3

Course Assessment methods

Direct		Indirect
CIE test I (10) CIE test II (10) CIE test III (10) CIE test IV(15)(Laboratory)	Assignment/ Quiz/Seminar (5) Total CIE: 50 marks Semester End Examination (50) [SEE-Theory(35 marks), Lab(15 marks)]	Course end survey

Unit 01: BOOLEAN ALGEBRA AND LOGIC GATES **9 Hours**

Boolean Algebra: Basic definitions, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Simplification of Boolean functions. Gate-Level Minimization: The Map Method (K-map up to 4 variable), Product of Sums and Sum of Products Simplification, Digital logic gates - NAND and NOR Implementation- Quine-McCluskey method of minimization - CMOS logic families.

14/6/25

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Unit 02 : COMBINATIONAL LOGIC CIRCUITS	9 Hours

Design of Half and Full Adders - Half and Full Subtractors - Binary Parallel Adder -Carry look ahead Adder- BCD Adder – Code converters - BCD to Excess-3 – Magnitude Comparator – Decoders – Encoders – Priority Encoder -Multiplexers – Demultiplexers

Unit 03 : SEQUENTIAL LOGIC CIRCUITS	9 Hours

Flip-Flops – SR – D- JK-T– Master Slave JK Flip-Flop – Conversion of Flip Flops – Design of Clocked Sequential Circuits – Moore/Mealy models- State Diagram – State Table – State Reduction and Assignment - Verilog HDL code for flip-flops.

Unit 04 : REGISTERS AND COUNTERS	9 Hours

Registers – Shift Registers – SISO – SIPO – PIPO — Synchronous Counters – Up-down Binary Counter – Ring Counter – Johnson Counters – Asynchronous Counters – Asynchronous Design Procedure – Race Free State Assignment – Hazards .

Unit 05 : PROGRAMMABLE LOGIC DEVICES AND VERILOG HDL	9 Hours

Programmable Logic Devices –PROM - Programmable Logic Array – Programmable Array Logic – Introduction to FPGA.

Introduction to Verilog HDL- Operators, Dataflow Modelling, Gate Level Modelling, Behavioural Modeling - Verilog HDL code for adder – Multiplexer - flip-flops - shift registers and counters.

List of Experiments **30 Hours**

1. Design and implementation of
   (a) Boolean theorems & functions
   (b) Half Adder and Full Adder, Half Subtractor and Full Subtractor
   (c) Parallel Adder cum Subtractor
   (d) Magnitude Comparator

2. Design and implementation of
   (a) Code Converters – Binary to Gray and Gray to Binary
   (b) BCD to Excess 3 and Excess 3 to BCD

3. Design and implementation of
   (a) Multiplexer
   (b) Demultiplexer
   (c) Decoder
   (d) Encoder
   (e) Parity Generator and Checker

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4. Design and implementation of
   (a) Asynchronous Counter
   (b) Synchronous Counter
   (c) Ring Counter
   (d) Johnson Counter

5. Design and implementation of Shift Registers – SISO, SIPO and PIPO.

Theory: 45 Hrs	Tutorial: --	Practical: 30 Hrs	Project: --	Total Hours: 75 Hrs

TEXT BOOKS

1.	M. Morris Mano and Michael D. Ciletti, 'Digital Design with an Introduction to the Verilog HDL', 6th Edition, Pearson Education, 2018.
2.	Schilling, Herbert Taub and Donald, 'Digital Integrated Electronics', Tata McGraw-Hill, 2017.

REFERENCES

1.	John F Wakerly , 'Digital Design Principles and Practices', 4th Edition, Prentice Hall India, 2008.
2.	A.Anandkumar, 'Fundamentals of digital circuits, 4th Edition, Prentice Hall India, Paper back'2016.
3.	Jayaram Bhasker, 'A Verilog HDL Primer', 2nd E, BS publications, Paper back'2008.
4.	S.Salivahanan and S.Arivazhagan, "Digital Electronics", 1st Edition, Vikas Publishing House pvt Ltd, 2018.
5.	Albert Paul Malvino and Donald P. Leach, "Digital Principles and Applications, McGraw-Hill, 4th edition, 1986.

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U23EC303	ANALOG CIRCUITS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Explain the characteristics of feedback amplifiers and oscillators.
CO2:	Examine the characteristics of multistage amplifiers and large signal amplifiers
CO3:	Design linear analog circuits using op-amps.
CO4:	Analyze the non linear analog circuits using op-amps.
CO5:	Analyze the operation of DAC/ADC and PLL.

Pre-requisite:

Fundamental of Electronics, Electron Devices.

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO2	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO3	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO4	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO5	3	3	3	2	2	2	2	1	1	1	1	1	3	3

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01 : FEED BACK AMPLIFIERS AND OSCILLATORS — **9 Hours**

Classification– Basic Concepts – General Characteristics of Negative Feedback Amplifiers–Effect of Negative Feedback on Input and Output resistance -Feedback topologies – Voltage Series – Current Series –Current Shunt-Voltage Shunt-Tuned Amplifiers and its types-Single tuned –Double tuned - Classification of Oscillators –LC Oscillators.

14/6/2025

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Unit 02 : MULTISTAGE AMPLIFIERS AND LARGE SIGNAL AMPLIFIERS	9 Hours
Different Coupling schemes- Direct Coupling-RC Coupling– Transformer Coupling- General Analysis of Cascade and Cascode Amplifiers – Introduction to Large Signal Amplifiers - Class A Amplifier– Class B Amplifier –Class AB Amplifier – Class C Amplifier.	
Unit 03 : OP – AMP CHARCTERISTICS AND APPLICATIONS	**9 Hours**
Introduction – AC and DC Characteristics of Op amp— Applications of Op-amp– Inverting – Non Inverting – Summing amplifier- Differential amplifier-Instrumentation amplifier - Voltage to Current – Current to Voltage Converters -Differentiator – Integrator– Log and Antilog amplifiers –Active filters-LPF-HPF-BPF-BRF.	
Unit 04 : OP - AMP NONLINEAR CIRCUITS AND WAVEFORM GENERATORS	**9 Hours**
Voltage comparators – Schmitt trigger – Precision rectifiers –-Analog switches-Sample and Hold circuits -Sine wave generators – RC phase shift oscillator– Wien bridge oscillator– Multivibrators using IC 741 – Astable – Monostable - Multivibrators using IC 555 – Astable – Monostable.	
Unit 05 : DAC, ADC & PHASE LOCKED LOOP	**9 Hours**
Introduction-Basic DAC Techniques –Binary Weighted Resistor type - R to 2R ladder type –ADC – Successive Approximation type– Flash Type –Single Slope type-Dual slope type - Phase locked loop – Monolithic PLL.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	David A. Bell, "Electronic Devices and Circuits", TMH, 5th Edition, 2010.
2.	Ramakant A. Gayakwad, "Op-Amps and Linear Integrated Circuits", Pearson Publication, 4th Edition, 2012.

REFERENCES

1.	Dr.Sanjay Sharma, "Electronic Principles", S.K.Kataria and Sons, 3rd Edition, 2014.
2.	D.Roy Choudhry, Shail Jain, "Linear Integrated Circuits", New Age Publication, 2018.

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U23EC304	CIRCUIT THEORY	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Apply basic laws to calculate the voltage, current and power for electric circuits.
CO2:	Identify the network topologies of circuits.
CO3:	Analyse various dc circuits using network theorems.
CO4:	Analyze the resonant circuits and coupled circuits.
CO5:	Analyze the two port networks for various parameters.

Pre-requisite:

Fundamental of Electrical and Electronics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3		2			2	3	2	3	3
CO2	3	3	3	3	3		2			2	3	2	3	3
CO3	3	3	3	3	3		2			2	3	2	3	3
CO4	3	3	3	3	3		2			2	3	2	3	3
CO5	3	3	3	3	3		2			2	3	2	3	3

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01 : BASICS OF CIRCUIT ANALYSIS — **9 Hours**

Mesh and Nodal analysis – Star Delta Transformation Techniques –Concept of Duality – Dual Network – Graphs of a Network – Tree, Twig, Links and Branches – Incidence Matrix – Tie-Set Matrix Formation and Cut-Set Matrix Formation of a Graph.

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Unit 02 : CIRCUIT THEOREMS	9 Hours
DC Analysis: Superposition Theorem – Thevenin's Theorem – Norton's Theorem – Reciprocity Theorem – Maximum Power Transfer Theorem – Millman's Theorem -Tellegen's Theorem.	
Unit 03 : SERIES RESONANT CIRCUITS AND COUPLED CIRCUITS	**9 Hours**
Resonances-Series Resonance – Impedance and Phase Angle of a Series Resonance Circuit – Voltages and Currents in a Series Circuit – Quality Factor. Coupled Circuits: Self-Inductance – Mutual Inductance – Dot Conversion – Coupling Coefficient	
Unit 04 : TRANSIENTS	**9 Hours**
DC Response of an R-L Circuit – DC Response of an R-C Circuit – DC Response of an R-L-C Circuit – Sinusoidal Response of R-L Circuit – Sinusoidal Response of R-C Circuit – Sinusoidal Response of R-L-C Circuit.	
Unit 05: TWO PORT NETWORKS	**9 Hours**
Two port Network – Open Circuit Impedance (Z) Parameters – Short Circuit Admittance (Y) Parameters – Transmission (ABCD) Parameters – Hybrid (h) Parameters –Inter Relationship of Different Parameters.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	William H. Hayt, Jack E. Kemmerly, Jamie D. Phillips, Steven M. Durbin, "Engineering Circuit Analysis", Mc-Graw Hill, 9th Edition, 2020.
2.	Charles K. Alexander, Matthew N. O. Sadiku, "Fundamentals of Electric Circuits", Mc-Graw Hill, 7th Edition, May 2022.

REFERENCES

1.	Sudhakar, Shyammohan S Palli, "Circuits and Networks Analysis and Synthesis", Mc-Graw Hill, 5th Edition 2019.
2.	Ravish R Singh," Networks Analysis and Synthesis", Mc-Graw Hill Education, 5th Edition 2019.
3.	M.L. Soni and J.C. Gupta, A Course in "Electrical Circuits Analysis", Dhanpat Rai & Co, 2015.
4.	Prof. Nageswara Rao, "Circuit Theory", A.R Publications, New Revised Edition, 2018.

Prepared By
Dr S.Vijayasarathi

Approved By
14/6/2025
Dr.R.S.Sabeenian

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U23EC305	ANALOG CIRCUITS LAB	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO6:	Design amplifiers and oscillators using BJT.
CO7:	Design and construct linear and non linear circuits using Op amp.
CO8:	Analyze the characteristics of 555 timer applications and PLL.

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO2	3	3	3	2	2	2	2	1	1	1	1	1	3	3
CO3	3	3	3	2	2	2	2	1	1	1	1	1	3	3

Course Assessment methods

Direct			Indirect
CIE test I	(15)	RTPS (10)	Course end survey
Quiz 1	(5)	Record (10)	
CIE test II	(15)	Total CIE: **60 marks**	
Quiz 2	(5)	Semester End Examination: **40 marks**	

List of Experiments

1. Obtain the frequency response of Voltage Series Feedback amplifiers for various parameters.
2. Construct Hartley and Colpitts Oscillators to generate a Sinusoidal waveform.
3. Design and test a differential amplifier in i) Common Mode ii) Difference Mode.
4. Design Class B power amplifier and calculate its efficiency.
5. Design Inverting and Non – Inverting amplifier using Op- Amp IC 741.
6. Design Differentiator and Integrator using Op- Amp IC 741.
7. Design Schmitt trigger circuit using Op- Amp IC 741.

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8. Design first order low pass and high pass filters using Op- Amp IC 741.
9. Design band pass filters using Op- Amp IC 741.
10. Design RC phase shift and Wien bridge oscillators using Op- Amp IC 741.
11. Design of Astable and Monostable Multivibrators using Op- Amp IC 741.
12. Design of Astable and Monostable Multivibrators using IC 555.
13. Design the circuit using PLL and obtain its characteristics.

Theory: --	Tutorial: --	Practical: 30 Hrs	Project:--	Total Hours: 30 Hrs

Prepared By
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ECE - III sem

U23CS308	DATA STRUCTURES Common to ECE & EXE	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Implement abstract data types for linear data structures
CO2:	Solve real world problems using stack and queue linear data structures
CO3:	Apply various non-linear tree data structures in real time applications
CO4:	Design algorithms to solve common graph problems
CO5:	Analyze various searching, sorting and hashing techniques

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

Cos	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	1	1	1	1	-	1	1	2	1	3	2
CO2	2	2	1	2	3	2	1	-	2	1	1	2	3	2
CO3	3	2	3	1	3	1	-	1	2	1	2	1	2	2
CO4	2	3	3	3	3	1	-	1	1	1	2	1	2	2
CO5	2	2	1	2	2	1	-	1	1	1	1	2	3	1

Course Assessment methods

Direct		Indirect
CIE test I (9) CIE test II (9) CIE test III (10) Objectives Test (7)	Assignment/seminar/Quiz (5) Total CIE: **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01: LINEAR DATA STRUCTURES – LIST	**9 Hours**
Abstract Data Types (ADTs) – List ADT – Array-based implementation – Linked list implementation - Singly linked lists - Circularly linked lists - Doubly-linked lists – Applications of lists	
Unit 02: LINEAR DATA STRUCTURES – STACKS, QUEUES	**9 Hours**
Stack ADT – Operations– Evaluating arithmetic expressions - Conversion of Infix to postfix expression – Queue ADT – Operations – Circular Queue – Double ended queue – Applications of Stacks and queues	
Unit 03: NON-LINEAR DATA STRUCTURES – TREES	**9 Hours**
Trees – Traversals – Binary Trees – Expression trees – Applications of trees – Binary search trees - AVL Trees – B-Tree – Heap – Applications of heap -Tries.	

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Unit 04: NON-LINEAR DATA STRUCTURES – GRAPHS	9 Hours
Graphs - Representation of graph – Graph traversals – Breadth-first traversal – Depth-first traversal – Minimum Spanning Trees: Prim's algorithm, Kruskal's algorithm – Shortest path algorithms: Dijkstra's algorithm- Applications of Graphs: Topological Sort.	
Unit 05: SEARCHING, SORTING AND HASHING TECHNIQUES	**9 Hours**
Searching - Linear Search – Binary Search, Sorting – Bubble sort – Selection sort – Insertion sort – Merge sort, Hashing - Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs

TEXTBOOKS

1. Mark Allen Weiss, "Data structures and Algorithm Analysis in C", Pearson Education, New Delhi, Second Edition, 2020.

REFERENCES

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest , Clifford Stein, "Introduction to Algorithms" ,4th Edition, MIT Press, 2022.
2. Jean Paul Tremblay and Sorenson, "An Introduction to Data Structures with Applications", McGraw Hill Publishing Company, New Delhi, Second Edition, 2017.
3. Yedidyah Langsam, Moshe J Augenstein and Aaron M Tanenbaum, "Data Structures using C and C++", Prentice Hall of India/ Pearson Education, New Delhi, 2015.
4. Ellis Horowitz, SartajSahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Silicon Press, New Jersey, Second Edition, 2008

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U23CS309	DATA STRUCTURES LAB	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1	Design and develop simple programs using data structures
CO2:	Apply non-linear data structures for various real time applications
CO3:	Design shortest path algorithm for various real life applications

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	1	1	1	2	1	1	2	1	1	2	3
CO2	2	3	1	2	3	2	1	-	2	2	1	2	3	2
CO3	3	2	3	1	3	1	2	-	2	1	2	1	3	2

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz 1- (5) CIE test II (15) Quiz I1- (5)	RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination (40 marks)	Course end survey

List of Experiments:

1. Implementation of Lists, Stacks and Queues
2. Implementation of Binary Tree and Traversal Techniques
3. Implementation of Binary Search Trees
4. Implementation of AVL Trees
5. Implementation of B-trees
6. Implementation of graphs using BFS and DFS.
7. Implementation of Prim's algorithm.
8. Implementation of Kruskal's algorithm
9. Implementation of Dijkstra's algorithm
10. Implementation of Hashing and Collision Resolution Technique.
11. Implementation of Heap
12. Implement of Sorting and searching Techniques

Theory: 0	Tutorial: 0	Practical: 30Hrs	Project:0	Total Hours: 30 Hrs

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U23GE302	ENVIRONMENT AND CLIMATE SCIENCE	L	T	P	J	C
		2	0	0	0	0

Course Outcomes

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

CO1:	Describe the importance of the acute need for environmental awareness and discuss significant aspects of natural resources like forests, water and food resources.
CO2:	Illustrate the concepts of an ecosystem and provide an overview of biodiversity and its conservation.
CO3:	Analyze the causes, effects of various environmental pollution and their remedial measures.
CO4:	Provide solutions to combat environmental issues like global warming, acid rain, ozone Layer depletion.
CO5:	Analyze the effect of climate change in various sectors and their remedial measures.

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2				2	2							-
CO2	2	-					1							-
CO3	3	2				2	3							2
CO4	3	2				2	3							2
CO5	3	2				2	2							2

Course Assessment methods

Direct		Indirect
CIE test I (30) - Theory CIE test II (30) - Theory CIE test III (40)- Theory	Total CIE: **100 marks** Semester End Examination – **NIL**	Course end survey

Unit 01: INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES — **6 Hours**

Definition, Scope and Importance Forest Resources: - Use and over - exploitation, deforestation, Case Studies, Water Resources: - Use and Over-Utilization of Surface and ground water, Floods, Drought, Food Resources-Effects of Modern Agriculture, Fertilizer- Pesticide Problems-Role of an Individual in Conservati of Natural Resources.

Unit 02: ECOSYSTEMS AND BIODIVERSITY — **6 Hours**

Structure and Function of an Ecosystem-Energy Flow in the Ecosystem -Food Chains, Food Webs and Ecological Pyramids.

Introduction to Biodiversity-Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical, Aesthetic and Option Values-India as a Mega-Diversity Nation-Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts – Endangered and Endemic Species of India-Conservation of Biodiversity: In-Situ and Ex-Situ conservation of Biodiversity.	
Unit 03: ENVIRONMENTAL POLLUTION	**6 Hours**
Definition – Causes, Effects and Control Measures of: - (A) Air Pollution (B) Water Pollution (C) Soil Pollution (D) Marine Pollution (E) Noise Pollution (F) Thermal Pollution, Solid Waste Management- Effects and Control Measures of Acid Rain – Role of an Individual in Prevention of Pollution.	
Unit 04: FUNDAMENTALS OF CLIMATE CHANGE	**6 Hours**
Sustainable Development-Climate Change- Causes and effects of Global Warming-Effect of global warming in food supply, plants, sea, coral reef, forest, agriculture, economy-Kyoto Protocol in reduction of greenhouse gases-Ozone Layer Depletion-mechanism, effects and control measures- Montreal Protocol to prot ozone layer depletion-Rainwater Harvesting-Effect of climate change due to air pollution Case study - CNG vehicles in Delhi.	
Unit 05: EFFECT OF CLIMATE CHANGE	**6 Hours**
Fungal diseases in forests and agricultural crops due to climatic fluctuations - Growing energy needs - effect of climate change due to non-renewable energy resources. Renewable energy resources in the prevention of climatic changes- Effect of climatic changes in ground water table, garments, monuments, buildings, consumption of energy, agriculture and in electric power sector - Carbon credit - carbon footprint - disaster management -Role of an individual to reduce climate change.	

Theory: 30	Tutorial: --	Practical: --	Project:--	Total Hours: 30 Hrs

TEXT BOOKS

1.	Miller, T.G. Jr., "Environmental Science", Wadsworth Pub. Co. 2018.
2.	Anubha Kaushik and Kaushik, "Environmental Science and Engineering" New Age International Publication, 4th Multicolour Edition, New Delhi, 2014.

REFERENCES

1.	S. Radjarejesri et al., "Environmental Science" Sonaversity, Sona College of Technology, Salem, 2018.
2.	Masters, G.M., "Introduction to Environmental Engineering and Science", Pearson Education Pvt., Ltd., 2nd Edition, 2004.
3.	Erach, B., "The Biodiversity of India", Mapin Publishing P.Ltd.,Ahmedabad, India.
4.	Erach Bharucha, "Textbook of Environmental Studies for Undergraduate Courses", 2005, University Grands Commission, Universities Press India Private Limited, Hyderguda, Hyderabad – 500029.

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ABOUT THE COURSE

Design thinking is a systematic method of solving problems. This method is unique that it starts and ends with humans. The design thinkers start by observing, interviewing or just plain experiencing a situation. Then, they proceed to improve the situation of the humans by solving problems for them.

COURSE LAYOUT

Week 1 : Introduction to Design Thinking
Week 2 : Empathize Phase: Customer Journey Mapping
Week 3 : Analyze Phase: 5-Whys and How might we...
Week 4 : Solve Phase: Ideation: Free Brainstorming & Make/Test Phase: Prototype

TOTAL HOURS : 15

BOOKS AND REFERENCES

Prescribed Textbook for the course:

1.Karmic Design Thinking by Prof. Bala Ramadurai, available at Amazon (paperback), Amazon (e-book), Flipkart, Pothi, bookspace.in

REFERENCES

1.Design: Creation of Artifacts in Society by Prof. Karl Ulrich, U. Penn
2.Change by Design by Tim Brown.

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U23GE301	SOFT SKILLS AND APTITUDE - I	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1:	Demonstrate capabilities in specific soft-skill areas using hands-on and/or case-study approaches
CO2:	Solve problems of greater intricacy than those in BA-I and II in stated areas of quantitative aptitude and logical reasoning
CO3:	Demonstrate higher than BA-I and II levels of verbal aptitude skills in English regarding specific topics.

Pre-requisite: Basic Aptitude I & II

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	1	1	2	2	3	3	3	1	3	1	1
CO2	3	3	3	2	2	2	1	3	3	2	1	3	2	2
CO3	1	1	1	1	1	1	1	3	3	3	1	3	1	1

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz - I (5) CIE test II (15) Quiz – II (5)	RTPS (10) Record (10) Total CIE marks : **60 marks** Semester End Examination : **40 marks**	Course end survey

1.Soft Skills

Demonstrating soft-skill capabilities with reference to the following topics:

a. Attitude building
b. Self-awareness and self -acceptance
c. Dealing with criticism
d. Innovation and creativity
e. Problem solving and decision making
f. Public speaking
g. Group discussions.

2. Quantitative Aptitude and Logical Reasoning	**Solving problems with reference to the following topics:** a. Vedic Mathematics b. Simplification c. Number Properties d. Averages e. Percentage f. Profit Loss and Discount g. Ratio & Mixtures h. Equation i. Problem on Ages j. Data interpretation
3. Verbal Aptitude	**Demonstrating English language skills with reference to the following topics:** a. Verbal analogy b. Tenses c. Prepositions d. Reading comprehension e. Choosing correct / incorrect sentences f. Describing pictures

Theory : ---	**Tutorial : ----**	**Practical : 30hrs**	**Project : ---**	**Total hours : 30hrs**

6/06/2025

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV under Regulations 2023 (CBCS)
Branch: Electronics and Communication Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23EC401	Electromagnetics and Transmission Lines	3	1	0	0	4	PC	60	TT
2.	U23EC402	Microprocessors and Microcontrollers	3	0	0	0	3	PC	45	T
3.	U23EC403	Control Systems	3	0	0	0	3	PC	45	T
4.	U23EC404	Digital Signal Processing	3	0	2	0	4	PC	75	TL
5.	U23EC405	Analog Communication Systems	2	0	2	0	3	PC	60	TL
6.	U23IT408	Database Management Systems	3	0	0	0	3	ES	45	T
7.	U23GE402	**Audit Course:** Essence of Indian Traditional Knowledge	2	0	0	0	0	AC	30	T
Practical courses										
8.	U23EC406	Microprocessors and Microcontrollers Laboratory	0	0	2	0	1	PC	30	L
9.	U23IT409	Database Management Systems Laboratory	0	0	2	0	1	ES	30	L
10.	U23ENG401	Communication Skills Laboratory	0	0	2	0	1	EEC	30	L
11.	U23GE401	Soft Skills and Aptitude-II	0	0	2	0	1	EEC	30	L
Total Credits							24		480	

*T- Theory, TT- Theory with Tutorial, TL- Theory with Laboratory, TP- Theory with Project, TLP- Theory with Laboratory and Project, L-Laboratory, LT- Laboratory with Theory, LP- Laboratory with Project, P-Project

Approved By

12/12/2025			
Chairperson, Electronics and Communication Engineering BoS	**Member Secretary, Academic Council**	**Dean-Academics**	**Chairperson, Academic Council & Principal**
Dr.R.S.Sabeenian	**Dr.R.Shivakumar**	**Dr.J.Akilandeswari**	**Dr.S.R.R.Senthil Kumar**

Copy to:-

HOD/ Electronics and Communication Engineering, Fourth Semester B.E. ECE Students and Staff, COE

U23EC401	ELECTROMAGNETICS AND TRANSMISSION LINES	L	T	P	J	C
		3	1	0	0	4

Course Outcomes

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

CO1:	Understand the vector components and transformations across Cartesian, cylindrical, and spherical coordinate systems.
CO2:	Evaluate the inductance using magneto static principles, and develop models to predict their behaviour in complex circuits and to compare the capacitance by applying mathematical models.
CO3:	Apply Maxwell's Equations to derive and solve the wave equations for electromagnetic fields, demonstrating a comprehensive understanding of their interplay in various media.
CO4:	Analyse electromagnetic wave propagation in generic transmission line geometries.
CO5:	Design impedance matching transmission line and calculate the reflection coefficient, SWR using smith chart.

Pre-requisite:

Physics for ECE

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	-	-	1	2	-	-	2	-	2	-	2
CO2	3	3	-	-	-	1	2	-	-	2	-	2	-	2
CO3	3	3	-	-	-	1	2	-	-	2	-	3	-	2
CO4	3	3	-	-	-	2	2	-	-	2	-	3	-	2
CO5	3	3	-	-	-	2	2	-	-	2	-	3	-	2

Course Assessment methods

Direct		Indirect
CIE test I (8) CIE test II (8) CIE test III (8) Objectives Test (6) Attendance (5)	Assignment/seminar/Quiz (5) Total CIE : **40 marks** Semester End Examination: **60 marks**	Course end survey

Unit 01: INTRODUCTION TO COORDINATE SYSTEMS	**12 Hours**

Introduction– Vector Components and Unit Vector- Cartesian Co-ordinate System - Cylindrical Coordinate System – Spherical Coordinate System – transformation of vectors from one coordinate system to another and problems - Relation between different coordinate systems.

Unit 02: STATIC ELECTRIC FIELD & MAGNETIC FIELD	**12 Hours**

Electric field intensity- Energy Expended in Moving a Point Charge in an Electric Field– Definition of Potential Difference and Potential – Potential Gradient–Electric field intensity for Dipole – Capacitance – Capacitance for parallel sheet and coaxial cable – Derivation of Poisson's and Laplace's Equations. Magnetic field- Magnetic flux- difference between electric flux and magnetic flux lines – Inductance-inductance of a Toroid - Boundary conditions for a magnetic field.

Unit 03: TIME VARYING FIELDS AND PLANE WAVES	**12 Hours**
Faraday's Law – Displacement Current – Maxwell's Equation in Point Form – Maxwell's Equation in Integral Form - Poynting's Theorem- EM waves-plane wave-uniform plane wave- derivation of a wave equation for a free space in terms of E & H-Wave equation for a conducting medium-Wave Propagation in good conductor-Skin Effect.	

Unit 04: TRANSMISSION LINE THEORY	**12 Hours**
Different types of transmission lines –Characteristic impedance –Propagation Constant-T and ∏ Section equivalent to lines. General Solution of the transmission line – Standard forms for voltage and current of a line terminated by an impedance – physical significance of the equation and the infinite line –Standard forms for the input impedance of a transmission line terminated by an impedance –reflection coefficient.	

Unit 05: IMPEDANCE MATCHING IN HIGH FREQUENCY	**12 Hours**
Standing waves and standing wave ratio on a line – One eighth wave line – The quarter wave line and impedance matching – the half wave line. The circle diagram for the dissipation less line – The Smith Chart – Application of the Smith Chart – Conversion from impedance to reflection coefficient and vice - versa. Impedance to Admittance conversion and vice versa – Input impedance of a lossless line terminated by impedance – single stub matching and double stub matching.	

Theory: 45 Hrs	**Tutorial: 15**	**Practical:**	**Project: --**	**Total Hours: 60 Hrs**

TEXT BOOKS

1.	Matthew N. O. Sadiku and S. V. Kulkarani, "*Principles of Electromagnetics*", 7th Edition Oxford University Press, May 2022
2.	J.D.Ryder,"Network, Lines and Fields," Pearson 2e, 2015.

REFERENCES

1.	W. H. Hayt and J. A. Buck, "*Engineering Electromagnetics*", TATA McGraw-Hill, 9th Edition, 2019
2.	G.S.Raju, Electromagentic Field Theory and Transmission Lines, 3e, Pearson Education India, 2012.
3.	Umesh Sinha, "Transmission lines and Networks", Sathya Prakasham Publishers, 1997.
4.	David K Cheng, " Field and wave Electromagnetics", Pearson edition, 2004
5.	John D. Kraus and Daniel A. Fleisch, "*Electromagnetics with Applications*", 5th Edition, McGraw Hill International Editon, 1999.

08/01/26
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U23EC402	MICROPROCESSORS AND MICROCONTROLLERS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Understand the 8086 processor architecture and instruction sets.
CO2:	Understand the interfacing of processor with memory and I/O device.
CO3:	Develop the assembly language program for I/O and timer related applications using 8051 MCU.
CO4:	Develop the I/O device interfacing with 8051 MCU.
CO5:	Examine the ARM processor and architecture of ARM LPC 2148 MCU.

Pre-requisite:

Number system Fundamental, Digital Electronics

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	2	2	1				1	3	3
CO2	3	3	2	2	2	2	2	1				1	3	3
CO3	3	3	3	2	2	2	2	1				1	3	3
CO4	3	3	3	2	2	2	2	1				1	3	3
CO5	3	3	3	2	2	2	2	1				1	3	3

Course Assessment methods

Direct			Indirect
CIE test I	(8)	Assignment/seminar/Quiz (5)	Course end survey
CIE test II	(8)	Total CIE : **40 marks**	
CIE test III	(8)	Semester End Examination: **60 marks**	
Objectives Test	(6)		
Attendance	(5)		

Unit 01: 8086 MICROPROCESSOR	**9 Hours**

Architecture of 8086 – Signals - Logical and Physical address- Memory segmentation- Stacks - Interrupts and Interrupt Service Routines - Instruction set – Addressing modes – Assembler Directives - Procedures – Macros - Assembly language programming.

UNIT 02: INTERFACING PERIPHERALS OF 8086 and CORE i3 PROCESSOR	**9 Hours**

Interfacing and programming 8086 with: Memory chips-Programmable Peripheral Interface -Timer Interface -Serial communication interface – Introduction on core i3 processor and i3 mother board.

Unit 03: 8051 MICROCONTROLLER	**9 Hours**

Architecture of 8051 – Special Function Registers (SFRs) - I/O Pins, Ports and Circuits - Instruction Set - Addressing Modes - Assembly Language Programming – Serial Port Programming - Timers-Programming 8051 Timers.	
Unit 04: INTERFACING 8051 WITH I/O PERIPHERALS	**9 Hours**
Interfacing 8051 with: DAC and ADC – LCD - Key switch matrix – Thermistor – LDR – Stepper motor and Driver -Case study on room temperature monitoring - Case study on street light controller – Casy study on limited angular movement.	
Unit 05: ARM PROCESSOR AND ARM BASED MCU	**9 Hours**
The ARM architecture basics - Architectural Inheritance - The ARM programmer model - 3 stage and 5 stage pipelining – ARM Core - ARM organization - Addressing Modes - ARM instruction set (data processing, Data transfer, Branching)- Thumb instruction set – Architecture of LPC 2148 ARM controller.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs

TEXT BOOKS

1.	Soumitra Kumar Mandal, "Microprocessors and Microcontrollers, Architecture, Programming and Interfacing using 8085, 8086 and 8051", McGrawHill Companies,2018
2.	Ajay V Deshmukh, "Microcontroller – Theory and Applications", Tata McGraw-Hill, 2007

REFERENCES

1.	M. Rafi Quazzaman, "Microprocessors Theory and Applications: Intel and Motorola", Prentice Hall of India, Pvt. Ltd., New Delhi, 2003
2.	13th Generation Intel core and Intel Core 14th Generation processor Datasheet, Vol 1 of 2, Doc. No: 743844, Rev.:012, Aug'2024. https://www.intel.com/content/www/us/en/content-details/743844/13th-generation-intel-core-and-intel-core-14th-generation-processors-datasheet-volume-1-of-2.html
3.	Lyla B. Das, "Embedded Systems – An Integrated Approach", Pearson, 2019
4.	Mohammed Ali Mazidi and Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded Systems",2nd Edition, Pearson Education Asia, New Delhi, 2008.
5.	Steve Furber, "ARM System on Chip Architecture", Pearson Publications, 2nd Edition, 2015

08/01/26

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U23EC403	CONTROL SYSTEMS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Derive the transfer function of a given system using mathematical models.
CO2:	Determine the time response of systems and analyse the steady state error.
CO3:	Calculate the frequency domain specifications using frequency response plots.
CO4:	Determine and analyse the stability of given system.
CO5:	Analyse the Controllability and Observability of a given system

Pre-requisite: -

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	2	2	3			1	2	1	3	2
CO2	3	3	2	3	2	2	3			1	2	1	3	2
CO3	3	3	2	3	2	2	3			1	2	1	3	2
CO4	3	3	2	3	2	2	3			1	2	1	3	2
CO5	3	3	2	3	2	2	3			1	2	1	3	2

Course Assessment methods

Direct			Indirect
CIE test I	(8)	Assignment/seminar/Quiz (5)	Course end survey
CIE test II	(8)	Total CIE : **40 marks**	
CIE test III	(8)	Semester End Examination : **60 marks**	
Objectives Test	(6)		
Attendance	(5)		

Unit 01 BASIC CONCEPTS AND SYSTEM REPRESENTATION — **9 Hours**

Introduction - Open loop and Closed loop systems - Mathematical models of control systems - Transfer functions - Mechanical Translational systems - Mechanical Rotational systems - Block Diagram Algebra - Signal Flow Graph - Mason's Gain formula.

Unit 02 TIME RESPONSE ANALYSIS	9 Hours
Time response - Standard Test Signals - Type and order of control system - Time Response of First order System for unit step, unit ramp and impulse input - Time Response of Second order System for unit step input - Time domain specifications - Steady State error and static error constants - Controllers - P, PI and PID.	
Unit 03 FREQUENCY RESPONSE ANALYSIS	**9 Hours**
Frequency response - Frequency domain Specifications - Resonant peak, Resonant frequency, Bandwidth, Cut-off rate, Gain margin and Phase margin - Frequency response plots - Polar plot - Bode plot - M and N Circles - Nichol's Chart.	
Unit 04 STABILITY ANALYSIS	**9 Hours**
The Concepts of Stability - Necessary Conditions for Stability - Relative stability - Routh Hurwitz Stability Criterion - Root Locus - Effect of addition of poles - Effect of addition of zeros - Nyquist Stability Criterion.	
Unit 05 COMPENSATORS AND STATE SPACE ANALYSIS	**9 Hours**
Compensators: Introduction - Types - Lag, Lead and Lag-Lead design using Bode plots. State Space Analysis: Concepts of State - State variables and State model for Linear Continuous time Systems - Controllability and Observability.	

Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs

TEXT BOOKS

1.	Samarajit Gosh, 'Control Systems Theory and Applications', Second new edition, Pearson publications, 2020.
2.	I.J.Nagrath and M.Gopal, 'Control Systems Engineering', 7th Edition, New Age International (P) Ltd,Publishers, 2023.

REFERENCE BOOKS

1.	M.Gopal, 'Control Systems, Principles and Design', Fourth Edition, Tata McGraw Hill, New Delhi, 2023.
2.	A.Nagoorkani, 'Control Systems Engineering', Third edition, RBA Publications, 2021.
3.	S.Palani,'Control Systems Engineering', Third Edition, Tata McGraw Hill,2016.
4.	Norman S. Nise ,'Control Systems Engineering' by, Wiley, 2018

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U23EC404	DIGITAL SIGNAL PROCESSING	L	T	P	J	C
		3	0	2	0	4

Course Outcomes

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

CO1:	Describe DFT , FFT and to perform its computations
CO2:	Design FIR digital filters using various techniques
CO3:	Design IIR digital filters using different techniques.
CO4:	Analyse the finite word length effects in signal processing
CO5:	Describe the fundamentals of digital signal processors

Pre-requisite: Signals and Systems

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	1			2	2	1	1	3	3
CO2	3	3	2	2	2	1			2	2	1	1	3	3
CO3	3	3	2	2	2	1			2	2	1	1	3	3
CO4	3	3	2	2	2	1			2	2	1	1	3	3
CO5	3	3	2	2	2	1			2	2	1	1	3	3

Course Assessment methods

Direct		Indirect
CIE test I (10) - Theory CIE test II (10) - Theory CIE test III (10) - Theory CIE test IV(10) - Laboratory Attendance (5)	Assignment / Quiz/ Seminar (5) Total CIE : **50 marks** Semester End Examination: **50 marks** [SEE- Theory (35 marks),Lab (15 marks)]	Course end survey

Unit 01: DISCRETE FOURIER TRANSFORM AND FFT — **9 Hours**

Introduction to DFT – Properties of DFT - Efficient computation of DFT- FFT algorithms – Radix-2 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms –Fast convolution- overlap save method and overlap add method.

Unit 02: INFINITE IMPULSE RESPONSE DIGITAL FILTERS — **9 Hours**

Design of analog Butterworth and Chebychev Filters – Design of IIR digital filters using impulse invariance technique – Design of IIR digital filters using bilinear transformation – pre warping – Frequency transformation in digital domain – Realization cascade and parallel form.

Unit 03: FINITE IMPULSE RESPONSE DIGITAL FILTERS	9 Hours
Amplitude and phase responses of FIR filters – Linear phase filters – Windowing techniques for design of linear phase FIR filters: Rectangular- Hamming- Hanning- Gibbs phenomenon –Principle of frequency sampling technique. Realization of FIR filters- Linear and cascade form.	
Unit 04: FINITE WORD LENGTH EFFECTS	**9 Hours**
Quantization noise – Quantization noise power - Truncation and rounding error – Input quantization error - Coefficient quantization error – Limit cycle oscillations- Dead band- Overflow error- Signal scaling-Multi Rate Signal Processing – Interpolation and Decimation.	
Unit 05: DIGITAL SIGNAL PROCESSORS	**9 Hours**
Architectural Features – Von Neumann architecture- Harvard architecture- Bus Architecture and Memory- Multiplier- Shifter- MAC Unit- ALU- Addressing Modes – Address Generation Unit - pipelining- Overview of instruction set of TMS320C54XX. Introduction of TMS320C6748 Processor.	

List of Experiments **30 Hours**

Using MATLAB

1. Circular convolution
2. Auto and Cross Correlation
3. Sampling and effect of Aliasing
4. Design of FIR Filters
5. Design of IIR Filters
6. DFT and FFT

Using TMS320C54 Processor

7. Generation of Signals
8. Arithmetic operations using DSP
9. Sampling of input signal and display
10. Implementation of FIR Filters
11. Implementation of IIR Filters
12. Study of TMS320C6748 Processor.

Theory: 45 Hrs	Tutorial: --	Practical: 30 Hrs	Project: --	Total Hours: 75 Hrs

TEXT BOOKS	
1.	John G Proakis- Dimtris G Manolakis-" Digital Signal Processing Principles-Algorithms and Application"- Pearson/PHI- 4th Edition- 2016
REFERENCES	
1.	B.Venkataramani & M-Bhaskar- "Digital Signal Processor Architecture- Programming and Application"- TMH 2017
2.	Allan V.Openheim, Ronald W.Sehafer & John R.Buck, "Discrete Time Signal Processing"- second edition Pearson/Prentice Hall, 2014.
3.	P.Ramesh Babu, "Digital Signal Processing"-SCITECH-2017.
4.	S.K.Mitra, "Digital Signal Processing- A Computer based approach"- Tata McGraw-Hill- 2006- New Delhi.
5.	S.Salivahanan, A.Vallavaraj, Gnanapriya, "Digital Signal processing" - McGraw Hill / TMH,2019.

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U23EC405	ANALOG COMMUNICATION SYSTEMS	L	T	P	J	C
		2	0	2	0	3

Course Outcomes

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

CO1:	Analyze the generation and detection methods of various AM systems.
CO2:	Analyze the modulation and demodulation methods of FM systems.
CO3:	Classify the types of noise and its effect on communication systems.
CO4:	Describe the noise performance of various Analog modulation systems.
CO5:	Analyze the performance parameters of information theory and the significance of source coding.

Pre-requisite: -

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	3	2	2	-	-	1	2	2	3	3
CO2	3	2	3	2	3	2	2	-	-	1	2	2	3	3
CO3	3	2	3	2	3	2	2	-	-	1	2	2	3	3
CO4	3	2	3	2	3	2	2	-	-	1	2	2	3	3
CO5	3	2	3	2	3	2	2	-	-	1	2	2	3	3

Course Assessment methods

Direct		Indirect
CIE test I (10) - Theory CIE test II (10) - Theory CIE test III (10) - Theory CIE test IV(10) - Laboratory Attendance (5)	Assignment / Quiz/ Seminar (5) Total CIE : **50 marks** Semester End Examination: **50 marks** [SEE- Theory (25 marks),Lab (25 marks)]	Course end survey

Unit I AMPLITUDE MODULATION SYSTEMS — **6Hours**

Modulation-Need For Modulation-Principles of Amplitude Modulation – Mathematical Expression for Single Tone AM – Power Relations in AM – Types of AM – DSBSC-SSBSC and VSB – Generation and Detection Methods – Comparison of Various AM Systems – AM transmitters – AM Receivers – TRF, Super-heterodyne Radio Receiver.

Unit II ANGLE MODULATION SYSTEMS — **6 Hours**

Frequency and Phase Modulation – Principles of FM – Expression for Single Tone FM – Frequency Analysis of FM – Transmission Bandwidth of FM – Narrow band frequency modulation and Wide band frequency modulation Generation Methods – Direct Method – Reactance Modulator and Indirect Method– Armstrong Method – FM Demodulators – Slope Detector, Foster Seeley Discriminator. FM Transmitters and Receivers – Pre-emphasis & De-emphasis.

Unit III NOISE THEORY **6 Hours**

Noise – Thermal Noise and Shot Noise – Narrow Band Noise and its representation using In-Phase and Quadrature Components – Noise Figure and its Expression in Terms of SNR – Overall Noise Figure Calculation for Cascaded Amplifiers – Friss Formula – Noise Temperature – Noise Bandwidth – Equivalent Noise Resistance.

Unit IV PERFORMANCE OF CW MODULATION SYSTEMS **6 Hours**

Channel SNR – Output SNR – Figure of Merit – Noise in DSBSC and SSBSC Systems using Coherent Detection – Noise in AM System using Envelope Detection – Noise Performance Analysis in FM System – FM Threshold Effect – Threshold Improvement in Discriminators – Pre-Emphasis and De-Emphasis in FM – Noise Performance Comparison between CW Modulation Systems.

Unit V INFORMATION THEORY AND CODING **6 Hours**

Amount of Information – Entropy – Information Rate – Source Coding Theorem, Code variance, Redundancy – Shannon-Fano Coding – Huffman Coding, Channel Capacity –Channel capacity Theorem (Shannon's Theorem) — Bandwidth – SNR Trade-Off – Mutual Information.

List of Experiments **30 Hours**

1. Amplitude Modulation and Demodulation.
2. Generation and Detection of DSB-SC Modulated signal.
3. Generation and Detection of SSB-SC Modulated signal.
4. Characteristics of AM Receiver (Selectivity and Sensitivity).
5. Frequency Modulation and Demodulation.
6. Spectral analysis of AM and FM Signals using Spectrum Analyser.
7. Pre-emphasis & De-emphasis.
8. Frequency Synthesizer.

Theory: 30 Hrs	Tutorial: --	Practical: 30 Hrs	Project: --	Total Hours: 60 Hrs

TEXT BOOKS

1. Michael Moher, Simon Haykin, "Communication Systems", 5th Edition, 2021.
2. R.P. Singh and S.D. Sapre, "Communication Systems– Analog and Digital", Tata McGrawHill,3rd Edition, 2014

REFERENCES	
1.	Wayne Tomasi, "Electronic Communication Systems", 5/e, Pearson Education, 2011.
2.	"Electronic Communcation System" by George Kennedy, Bernard Davis and SRM Prassanna, McGraw Hill, 2011
3.	H.Taub, D L Schilling, G Saha, "Principles of Communication", 3/e, 2011.
4.	Dr. Sanjay Sharma, "Analog Communication systems", S.K. Kataria & sons, 6th edition, 2013

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U23IT408	DATABASE MANAGEMENT SYSTEMS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1	Describe the need, background, architecture and evolution of database management system.
CO2	Construct ER diagrams that capture the requirements of an application and map the ER diagram to relational databases.
CO3	Write SQL queries to create, maintain, retrieve, manipulate and provide security to databases.
CO4	Design and evaluate the normality of a logical data model and normalize relational schema.
CO5	Explain the general ideas behind indexing techniques.

Pre-requisite: NIL

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3						1	1		1	2	3
CO2	3	3	2	1	1				1	1		1	2	2
CO3	3	3	3	1	1				1	1		1	2	2
CO4	3	3	3	1	1				1	1		1	2	2
CO5	3	1							1	1		1		

Course Assessment methods

Direct		Indirect
CIE test I (8) CIE test II (8) CIE test III (8) Objectives Test (6)	Attendance (5) Assignment/seminar/Quiz (5) Total CIE: 40 marks Semester End Examination (60)	Course end survey

UNIT I	INTRODUCTION	9 Hours

Database and Database Users: Characteristics of database approach, Advantages of DBMS Approach, Database Applications

Database system concepts and architecture: Data models, Schemas, Instance, Three schema architecture and data independence, DBMS languages, DBMS interfaces, database system Environment

UNIT II	ENTITY RELATIONSHIP AND RELATIONAL MODEL	9 Hours

ER model: Entity types, attributes, keys,, relationship types, constraints, weak entity, ER diagrams

Relational data model, relational constraints and relational Algebra: Relational model concepts, Relational constraints and Relational data base schema, update operations, basic Relational algebra operations, additional relational operations, ER to relational mapping

UNIT III	QUERY LANGUAGE	9 Hours

SQL: Data definition and constraints, Basic queries, insert, delete, update, Joins, complex queries, views, assertions and triggers

Database security and Authorization: security issues, grant/revoke privileges, SQL injections

UNIT IV	RELATIONAL DATABASE DESIGN	9 Hours

Functional dependencies and normalization: Functional dependencies, Normal forms: 1NF, 2NF, 3NF, Boyce Codd NF, decomposition

UNIT V	STORAGE STRUCTURES AND INDEXING	9 Hours

Secondary Storage Devices – Placing file records – Operations on files – unordered files – ordered files - hashing – RAID

Indexing Structures: Types of Single-Level Ordered Indexes, Multilevel Indexes – B+ trees

Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs

TEXT BOOKS

1.	Ramez Elmasri and Shamkant Navathe, "Fundamentals of Database Systems ", 7th Edition, Addison-Wesley, 2021

REFERENCES

1.	Abraham Silberschatz, Henry F. Korth and Sudarshan. S, "Database System Concepts", 7th Edition, McGraw-Hill, 2023
2.	Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2014.
3.	Date. C. J, Kannan. A, Swamynathan. S, "An Introduction to Database Systems", 8th Edition, Pearson Education, 2012
4.	Rajesh Narang, "Database Management systems", PHI Learning pvt. Ltd, New Delhi, 2011.

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U23EC406	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO1:	Write the assembly language programs to perform various arithmetic and logical operations using 8086 microprocessor
CO2:	Interface various peripheral ICs' and I/O devices with 8086 microprocessor
CO3:	Write the assembly language programs to interface input and output devices using 8051 microcontroller and ARM7TDMI/LPC2148.

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	2	2	1				1	3	3
CO2	3	3	2	2	2	2	2	1				1	3	3
CO3	3	3	3	2	2	2	2	1				1	3	3

Course Assessment methods

27/1/25

Direct				Indirect
CIE test I	(15)	RTPS	(10)	Course end survey
Quiz 1	(5)	Record	(10)	
CIE test II	(15)	Total CIE:	**60 marks**	
Quiz 2	(5)	Semester End Examination: **40 marks**		

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List of Experiments

1.	16-bit arithmetic manipulations using 8086 Microprocessor.
2.	32-bit arithmetic manipulations using 8086 Microprocessor.
3.	To find largest and smallest number from a string of bytes using 8086 Microprocessor.
4.	Sorting of array of data elements using 8086 Microprocessor.
5.	String Manipulation using 8086 Microprocessor.
6.	Experiments with 8255 using 8086 Microprocessor.
7.	8253 Timer Interface with the 8086 Microprocessor.

8.	Stepper Motor Interface with 8086 Microprocessor.			
9.	8-bit Manipulations using 8051 Microcontroller			
10.	16-bit Manipulations using 8051 Microcontroller			
11.	Array Operations-Sum of N Elements using 8051 Microcontroller			
12.	Generation of Time Delay using 8051 Microcontroller			
13.	Interfacing of switches and LEDs with 8051 Microcontroller			
14.	16-bit arithmetic manipulations using ARM7TDMI/LPC2148.			
15.	32-bit manipulation (addition and subtraction) using ARM7TDMI/LPC2148.			
16.	Interfacing of switches and LEDs using ARM7TDMI/LPC2148.			
Theory: --	**Tutorial: --**	**Practical: 30 Hrs**	**Project: --**	**Total Hours: 30 Hrs**

4/1/2025

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U23IT409	DATABASE MANAGEMENT SYSTEMS LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1	Build tables, and construct relationships among them using DDL commands
CO2	Write simple queries in SQL to retrieve data using different SQL constructs.
CO3	Write complex queries with sub queries and nested queries to retrieve data from database.

Pre-requisite: NIL

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3							3	3	2
CO2	3	3	3	3	3							3	3	2
CO3	3	3	3	3	3							3	3	2

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz I- (5) CIE test II (15) Quiz II- (5)	RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination (40 marks)	Course end survey

LIST OF EXPERIMENTS

1. Creating ER diagrams.
2. Creation of Tables using SQL- Create Tables, Attribute Data types and domains in SQL.
3. Specifying constraints in SQL.
4. Alter Tables to add, modify and remove columns & constraints and Dropping Tables.
5. Update the database using DML commands (insert, select, update and delete).
6. Query the database using simple queries.(selection of attributes, use of asterisk, pattern matching with like, use of arithmetic operators, distinct, ALL, where clause with relational operators, IN, between, order by).
7. Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING.
8. Queries using AND, OR, NOT, ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT etc.
9. Sub queries (Nested, Correlated) and Joins (Inner, Outer and Equijoin).
10. Create and update views.

Theory: --	Tutorial: --	Practical: 30 Hrs	Project: -	Total Hours: 30 Hrs

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U23ENG401	Communication Skills Laboratory (ECE & EXE)	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1:	Communicate confidently and appropriately in professional environment
CO2:	Demonstrate active interpersonal skill knowledge to excel in their career
CO3:	Use language efficiently to write winning proposals and effective reports, and to face interviews, participate in group discussions and present speeches.

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1					3	2	2		3	3		3	2	2
CO2					3	2	2		3	3		3	2	2
CO3					3	2	2		3	3		3	2	2

Course Assessment methods

Direct		Indirect
CIE test I (15) QUIZ I (5) CIE test II (15) Quiz II (5)	RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination: 40 marks	Course end survey

1. **Listening Comprehension**: listening to audio files and sequencing of sentences – Filling in the blanks – Listening comprehension.

2. **Reading Comprehension**: Filling in the blanks – Cloze exercises – Vocabulary building – Reading and answering questions.

3. **Speaking:** Correct Pronunciation – Common errors in spoken English.
Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

4. Making presentations: introducing oneself – introducing a topic – answering questions – individual presentation practice

5. Creating effective PPTs – presenting the visuals effectively

6. Using appropriate body language in professional contexts – gestures, facial expressions, etc.

7. Preparing job applications - writing covering letter and résumé

8. Applying for jobs online - email etiquette

9. Participating in group discussions – understanding group dynamics - brainstorming the topic – mock GD

10. Training in soft skills - persuasive skills – people skills - questioning and clarifying skills

11. Writing Project proposals: collecting, analysing and interpreting data / drafting the final report 12. Attending job interviews – answering questions confidently 13. Interview etiquette – dress code – body language – mock interview				
Theory:--	**Tutorial: --**	**Practical: 30 hours-**	**Project:--**	**Total Hours: 30 Hrs**
	Extensive Reading 1. The 7 Habits of Highly Effective People, Covey, Stephen R. New York: Free Press, 1989. 2. The Professional, Bagchi, Subroto. New Delhi: Penguin Books India, 2009.			

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1.	English and Soft Skills, Dhanavel, S.P. Hyderabad: Orient Black Swan Ltd. 2010.
2.	How to Prepare for Group Discussion and Interview, Corneilssen, Joep. New Delhi: Tata-McGraw-Hill, 2009.
3.	Group Discussion and Team Building D'Abreo, Desmond A. Mumbai: Better yourself books, 2004.
4.	The ACE of Soft Skills, Ramesh, Gopalswamy, and Mahadevan Ramesh. New Delhi: Pearson, 2010.
5.	Corporate Soft Skills, Gulati, Sarvesh. New Delhi: Rupa and Co. 2006.
6.	Presentation Skills for Students, Van Emden, Joan, and Lucinda Becker. New York: Palgrave Macmillan, 2004
7.	Dictionary of Common Errors, Turton, N.D and Heaton, J.B. Addision Wesley Longman Ltd., Indian reprint 1998.

HOD 4/11/25.

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U23GE402	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	L	T	P	J	C
		2	0	0	0	0

	Course Outcomes
	At the end of the course, the student will be able to
CO1:	Analyze the basics of Indian Traditional knowledge in modern scientific perspectives.
CO2:	Explain the basics of Vedic science and its applications in modern days.
CO3:	Discuss the introduction and objectives of modern science.
CO4:	Describe the contribution of Noble laureates for India's achievements in Science and Technology.
CO5:	Analyze the various traditional practices for holistic health care of human beings.
	Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2			2	-							2	2
CO2	2	2	2			2	-							2	2
CO3	2	2	2			2	-							2	2
CO4	2	2	2			2	-							2	2
CO5	2	2	2			2	-							2	2

Course Assessment methods

Direct			Indirect
CIE test I (30) - Theory CIE test II (30) - Theory CIE test III (40)- Theory	Total CIE: **100 marks** Semester End Examination – **NIL**		Course end survey

Unit 01: BASIC STRUCTURE OF INDIAN KNOWLEDGE SYSTEM		6 Hours
Indian Traditional Scriptures, Exposure to 4 – Vedas (the Rigveda, the Yajurveda, the Samaveda and the Atharvanaveda), 4 – Upavedas (Ayurveda, Dhanurveda, Gandharvaveda, Sthapatya, etc.), 6 – Vedangas (Shiksha, Kalp, Nirukta, Vyakaran, Jyotish).		

Unit 02: INDIAN KNOWLEDGE SYSTEM AND MODERN SCIENCE		6 Hours
Relevance of Science and Spirituality, Science and Technology in ancient India, Superior intelligence of Indian sages and scientists.		

Unit 03: INDIAN TRADITION AND CULTURE		**6 Hours**
The Indian way of life, Introduction to Indian tradition, The Scientific Outlook and Human Values – Basics of Applied Vedic Science – modern day application of Vedas and procedure – Ancient Indian Scientific thoughts.		
Unit 04: INDIAN ARTISTIC TRADITION		**6 Hours**
Introduction and overview of significant art forms in ancient India such as painting, sculpture, Civil Engineering, Architecture, Music, Dance, Literature, etc.		
Unit 05: YOGA AND HOLISTIC HEALTH CARE		**6 Hours**
Fundamentals of yoga and holistic health – Human biology – Importance and Practice of Yoga, Pranayama and other prevailing health care techniques – Diet and nutrition – Life management – Contemporary yogic models – case study.		

Theory: 30	Tutorial: --	Practical: --	Project:--	Total Hours: 30 Hrs

REFERENCES

1. Sivaramakrishnan, V., Cultural Heritage of India- Course Material, Bharatiya Vidya Bhavan, Mumbai, 5 th Edition, 2014.
2. Capra F., Tao of Physics, Shambhala, 2010
3. Chatterjee S.C. and Datta D.M., An Introduction to Indian Philosophy, University of Calcutta, 1984.
4. RN Jha, Science of Consciousness Psychotherapy and Yoga Practices, Vidyanidhi Prakasham, Delhi, 2016.
5. Raja Ram Mohan Roy, Vedic Physics, Mount Meru Publication ISBN: 9781988207049.
6. Swami Jitatmanand, Modern Physics and Vedant, Bharatiya Vidya Bhavan.

20-12-2024

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20/12/24.

Dr. M.RENUGA,
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Department of Humanities & Languages,
Sona College of Technology,
SALEM - 63

U23GE401	SOFT SKILLS AND APTITUDE – II	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

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

CO1:	Demonstrate capabilities in additional soft-skill areas using hands-on and/or case-study approaches
CO2:	Solve problems of increasing difficulty than those in SSA-I in given areas of quantitative aptitude and logical reasoning and score 65-70% marks in company-specific internal tests
CO3:	Demonstrate greater than SSA-I level of verbal aptitude skills in English regarding the given topics and score 65-70% marks in company-specific internal tests

Pre-requisite:

CO/PO, PSO Mapping

(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

CO-PO Mapping	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12
CO1	1	1	1	1	1	2	2	3	3	3	1	3
CO2	3	3	3	2	2	2	1	3	3	2	1	3
CO3	1	1	1	1	1	1	1	3	3	3	1	3

Course Assessment methods

Direct		Indirect
CIE test I (15) Quiz I (5) CIE test II (15) Quiz II (5)	RTPS (10) Record (10) Total CIE marks : 60 marks Semester End Examination : 40 marks	Course end survey

1.Soft Skills	**Demonstrating soft-skill capabilities with reference to the following topics:** a. SWOT b. Goal setting c. Time management d. Stress management e. Mindfulness f. Interpersonal and Intrapersonal skills g. Presentation skills h. Group discussions

2. Quantitative Aptitude and Logical Reasoning	**Solving problems with reference to the following topics:** a. Logarithm b. Progression c. Time & Work d. Simple Interest e. Compound Interest f. Time Speed & Distance g. Plane Geometry h. Mensuration for 2D i. Mensuration for 3D j. Syllogism
3. Verbal Aptitude	**Demonstrating English language skills with reference to the following topics:** a. Critical reasoning b. Theme detection c. Verbal analogy d. Prepositions e. Articles f. Cloze test g. Company specific aptitude questions

Theory: 0	**Tutorial: 0**	**Practical: 30hrs**	**Project: 0**	**Total Hours: 30hrs**

12/12/2025

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