

SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.E- Computer Science and Design

CURRICULUM and SYLLABI

[For students admitted in 2023-2024]

B.E / B.Tech Regulations 2023

Approved by BOS and Academic Council meetings

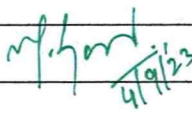
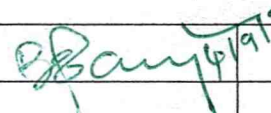
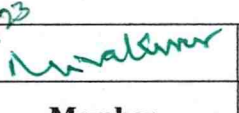
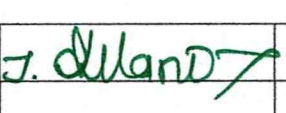

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: B.E Computer Science and Design

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.	U23MAT102A	Linear Algebra and Calculus with MATLAB	3	0	2	0	4	BS	75	TL
3.	U23PHY103B	Engineering Physics	3	0	0	0	3	BS	45	T
4.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T
5.	U23EGR107	Engineering Graphics	3	0	0	0	3	ES	45	T
6.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T
7.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T
Practical Courses										
8.	U23PHL110	Engineering Physics Laboratory	0	0	2	0	1	BS	30	L
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L
Total Credits							19			
Optional Language Courses**										
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

*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 with additional one credit
(Not accounted for CGPA calculation)

Approved By

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

Copy to:-

HOD/ Computer Science and Design, First Semester B.E. CSD Students and Staff, COE

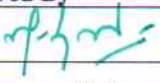
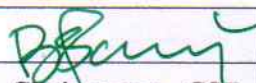
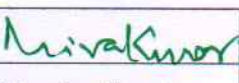
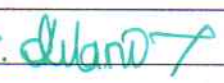

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: B.E Computer Science and Design

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	HL	30	T
2.	U23MAT202D	Discrete Mathematics	3	1	0	0	4	BS	60	TT
3.	U23CHE204C	Applied Chemistry	2	0	0	0	2	BS	30	T
4.	U23CPR205	Programming in C	3	0	0	0	3	ES	45	T
5.	U23BEE206B	Basics of Electrical and Electronics Engineering	3	0	0	0	3	ES	45	T
6.	U23EC203	Digital Principles and System Design	3	0	0	0	3	PC	45	T
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும்/ Tamil and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23CPL201	C Programming Laboratory	0	0	2	0	1	ES	30	L
10.	U23CHL211	Chemistry Laboratory	0	0	2	0	1	BS	30	L
11.	U23BEEL213B	Basics of Electrical and Electronics Engineering Laboratory	0	0	2	0	1	ES	30	L
Total Credits							21			
Optional Language Courses**										
11	U23OL1201	French - II	1	0	0	0	1	OL	15	T
	U23OL1202	German - II							15	T
	U23OL1203	Japanese - II							15	T
	U23OL1204	Korean - II							15	T

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Dr.M.Renuga	Dr.B.Sathiyabhama	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:- HOD/ Computer Science and Design, Second Semester B.E. CSD Students and Staff, COE

12.1.2024 Version 1.0 Semester 2

Prof. Dr. S. R. R. SENTHILKUMAR,
M.E.(Struct), Ph.D., MISTE, FIE, C.ENG(I), MICI.,
B.E/B.Tech Regulations 2023,
SONA COLLEGE OF TECHNOLOGY,
JUNCTION MAIN ROAD, SALEM-636 005.

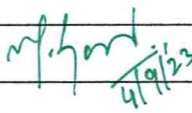
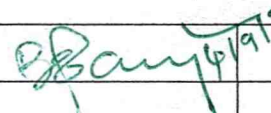
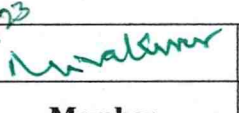
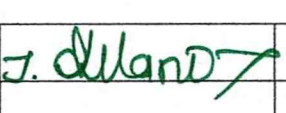

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: B.E Computer Science and Design

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory Courses										
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2.	U23MAT102A	Linear Algebra and Calculus with MATLAB	3	0	2	0	4	BS	75	TL
3.	U23PHY103B	Engineering Physics	3	0	0	0	3	BS	45	T
4.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T
5.	U23EGR107	Engineering Graphics	3	0	0	0	3	ES	45	T
6.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T
7.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T
Practical Courses										
8.	U23PHL110	Engineering Physics Laboratory	0	0	2	0	1	BS	30	L
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L
Total Credits							19			
Optional Language Courses**										
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

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HOD/ Computer Science and Design, First Semester B.E. CSD Students and Staff, COE

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:														
<ul style="list-style-type: none">• 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	PO9	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			
<ul style="list-style-type: none">• 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	
<ul style="list-style-type: none">• Tenses, Sentence Patterns• Instructions• Letter Writing - calling for quotations, placing orders					
Unit 03:				6 Hours	
<ul style="list-style-type: none">• Prefixes and Suffixes• Cover letter and resume writing					
Unit 04:				6 Hours	
<ul style="list-style-type: none">• Modal verbs, concord• Checklist• Letter Writing - Business communication, complaints, replies to queries from business customers					
Unit 05:				6 Hours	
<ul style="list-style-type: none">• If conditionals• Letter Writing - inviting dignitaries, accepting and declining invitations					
<p style="text-align: center;">Lab component:</p> <ol style="list-style-type: none">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 form5. 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 <ol style="list-style-type: none">1. She is Dancing Back to Life – A Short Story”2. The Story of Google – Sara Gilbert, published by Jaico3. 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. / COMPUTER SCIENCE AND DESIGN																
SEMESTER - I	LINEAR ALGEBRA AND CALCULUS WITH MATLAB											L	T	P	J	C
U23MAT102A												3	0	2	0	4
Course Outcomes																
At the end of the course, the student will be able to																
CO1:	find the rank of the matrix and solve linear system of equations by direct and indirect methods															
CO2:	apply the concepts of vector spaces and linear transformations in real world applications															
CO3:	apply the concepts of eigenvalues and eigenvectors of a real matrix and their properties to diagonalize the matrix.															
CO4:	find the Taylor's series expansion, Jacobians and the maxima and minima of functions of two variables															
CO5:	apply the appropriate techniques of multiple integrals to find the area and volume.															
Pre-requisites:																
<ul style="list-style-type: none">Fundamentals of elementary algebraFundamentals of calculus								<ul style="list-style-type: none">Fundamentals of geometryFundamentals 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	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	3	3		3	2							2	2	2	3	
CO2	3	3		3	2							2	2	2	3	
CO3	3	3		3	2							2	2	2	3	
CO4	3	3		3	2							2	2	2	3	
CO5	3	3		3	2							2	2	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	LINEAR SYSTEM OF EQUATIONS											9 Hours				
Rank of a matrix – solution of linear system of equations by matrix method, Gauss elimination, Gauss-Jordan, Gauss-Jacobi and Gauss-Seidel methods.																
Unit 02	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 03	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 04	MULTIVARIABLE CALCULUS	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 05	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.		
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, 1 st Edition, 2018.	
2.	T. Veerarajan, “Engineering Mathematics for Semesters I & II”, McGraw Hill Publishers, 1 st 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, 1 st Edition, 2017.	
REFERENCE BOOKS:		
1.	S. Lipschutz and M. L. Lipson, “Linear Algebra”, McGraw Hill Publishers, 6 th Edition, 2018.	
2.	E. Kreyszig, “Advanced Engineering Mathematics”, Wiley Publishers, 10 th Edition, Reprint, 2017.	
3.	C. Prasad and R. Garg, “Advanced Engineering Mathematics”, Khanna Publishers, 1 st Edition, 2018.	
4.	B. V. Ramana, “Higher Engineering Mathematics”, McGraw Hill Publishers, 29 th Reprint, 2017.	
5.	B. S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers, 44 th Edition, 2018.	
6.	D. Xu, “Calculus problem solutions with MATLAB”, Walter de Gruyter Publishers, 1 st Edition, 2020.	

S. Jayarathi

Dr. S. JAYABHARATHI

Head / Department of Mathematics
Sona College of Technology
Salem – 636 005

M. Renuka

Dr. M. RENUKA

BoS - Chairperson
Science and Humanities
Sona College of Technology
Salem – 636 005

BoS Date: 08. 07. 2023

Dr. S. JAYABHARATHI
ASSOCIATE PROFESSOR & HEAD
DEPARTMENT OF MATHEMATICS,
SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005. Tamilnadu.
Ph: 0427 - 4099999.

B.E / B.Tech Regulations 2023

Dr. M. RENUKA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology,
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	PO9	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 Uncertainty 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 <i>components</i> 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, 6 th Edition, 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.



Dr. C. SHANTHI, M.Sc., M.E., Ph.D.,
Professor of Physics
Head, Department of Sciences
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SALEM-636 005.



Dr. M. RENUGA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology,
SALEM - 636 005.

U23PHL110	ENGINEERING PHYSICS LABORATORY (Common to I Year B.E. CSE, CSE (AIML), & CSD)								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:	Determine the optical, thermal and electrical properties of materials by various physics laboratory equipment.													
CO2:	Access, process and analyse scientific information.													
CO3:	Solve problems individually and collaboratively.													
Pre-requisite: Capable of using Screw gauge, Vernier calliper, Travelling microscope, Spectrometer, able to handle burette.														

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		1		1			1					2
CO2	3	2		1		1			1					2
CO3	3	2		1		1			1					2
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	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 specific resistance of a given wire using Carey Foster's bridge.													
4	Determination of laser wavelength using diode laser.													
5	Determination of particle size of lycopodium powder using diode laser.													

6	Determination of acceptance angle and numerical aperture of an optical fibre using diode laser.	
7	Determination of Wavelength of Mercury spectrum using spectrometer.	
8	Determination of band gap of the given semiconductor diode.	
		TOTAL : 30 HOURS



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U23PPR105	PROBLEM SOLVING USING PYTHON PROGRAMMING									L	T	P	J	C
	(Common to ADS, IT, CSE, CSE(AI ML), CSD, CIVIL, BME, ECE, EEE, MECH and MCT Branches)									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	PO9	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.														

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, 2 nd 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		

U23EGR107	ENGINEERING GRAPHICS		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 Involutives.													
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	PO9	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 (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						
CONCEPTS AND CONVENTIONS - (Not for Examination).												9 Hours		
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 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 and cone, when the axis is inclined to one of the principal planes and parallel to the other by change of position 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.	Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2.	Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3.	Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4.	Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5.	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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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 Thinaï Concept of Tamils						
CO5:	Analyse Contribution of Tamils to Indian National Movement and Indian Culture						
Course Assessment methods							
Direct				Indirect			
CIE test I (30)		Total CIE: 100 marks		Course end survey			
CIE test II (30)		Semester End Examination: NIL					
CIE test III (40)							
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 சமணப் பெளத்த 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 திருவள்ளூர் 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, ஓயிலாட்டம், 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 அச்ச 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	பொருதை -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 Civilization 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 Thinaï Concept of Tamils						
CO5:	Analyse Contribution of Tamils to Indian National Movement and Indian Culture						
Course Assessment methods							
Direct				Indirect			
CIE test I (30)		Total CIE: 100 marks		Course end survey			
CIE test II (30)		Semester End Examination: NIL					
CIE test III (40)							
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. பிள்ளை (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).						
2	கணினித் தமிழ் – முமனவர ஂல. 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 Civilization 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.


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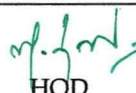
Dr. M.RENUGA,
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U23GE101	BASIC APTITUDE-1					L	T	P	J	C		
						2	0	0	0	0		
Course Outcomes												
At the end of the course, the student will be able to												
CO1:	Solve the problems in Divisibility , Division algorithm ,Successive Division 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:												
<ul style="list-style-type: none">• 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	PO11	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.			



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 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 announcement, 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)		Total CIE: 100 marks		Course end survey		
CIE test II (30)		Semester End Examination: NIL				
CIE test III (40)						
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: 1 st 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, cahier d'activités)					
3.	Reference books : La conjugaison, Dondon, Echo					



HOD

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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)			Total CIE: 100 marks Semester End Examination: NIL		Course end survey		
CIE test II (30)							
CIE test III (40)							
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)		Total CIE: 100 marks		Course end survey			
CIE test II (30)		Semester End Examination: NIL					
CIE test III (40)							
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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 Department of Humanities & Language

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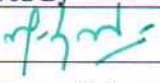
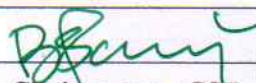
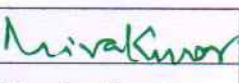
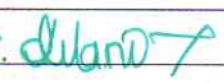

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: B.E Computer Science and Design

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	HL	30	T
2.	U23MAT202D	Discrete Mathematics	3	1	0	0	4	BS	60	TT
3.	U23CHE204C	Applied Chemistry	2	0	0	0	2	BS	30	T
4.	U23CPR205	Programming in C	3	0	0	0	3	ES	45	T
5.	U23BEE206B	Basics of Electrical and Electronics Engineering	3	0	0	0	3	ES	45	T
6.	U23EC203	Digital Principles and System Design	3	0	0	0	3	PC	45	T
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும்/ Tamil and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23CPL201	C Programming Laboratory	0	0	2	0	1	ES	30	L
10.	U23CHL211	Chemistry Laboratory	0	0	2	0	1	BS	30	L
11.	U23BEEL213B	Basics of Electrical and Electronics Engineering Laboratory	0	0	2	0	1	ES	30	L
Total Credits							21			
Optional Language Courses**										
11	U23OL1201	French - II	1	0	0	0	1	OL	15	T
	U23OL1202	German - II							15	T
	U23OL1203	Japanese - II							15	T
	U23OL1204	Korean - 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 with additional one credit
(Not accounted for CGPA calculation)

Approved By

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

Copy to:- HOD/ Computer Science and Design, Second Semester B.E. CSD Students and Staff, COE

12.1.2024 Version 1.0 Semester 2

Prof. Dr. S. R. R. SENTHILKUMAR,
M.E.(Struct), Ph.D., MISTE, FIE, C.ENG(I), MICI.,
B.E/B.Tech Regulations 2023,
SONA COLLEGE OF TECHNOLOGY,
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U23ENG201A	Technical English (Common to ADS, AIML, BME, CSD, CSE, CIVIL, ECE, EEE, MCT, FT, IT 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:														
<ul style="list-style-type: none">• 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 (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:											6 Hours			
<ul style="list-style-type: none">• Comparative adjectives• Recommendations• Conversation writing• Reading passages for specific information transfer														

Unit 02:				6 Hours	
<ul style="list-style-type: none">• Prepositions, adverbs• Note making• Reading passage with multiple choice questions, reading for gist and reading for specific information					
Unit 03:				6 Hours	
<ul style="list-style-type: none">• 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	
<ul style="list-style-type: none">• 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	
<ul style="list-style-type: none">• Pronouns• Transcoding – bar chart, pie chart, tabular column					
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 <ul style="list-style-type: none">1. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons2. Discover the Diamond in You – Arindham Chaudhari – Vikas Publishing House Pvt. Ltd.3. Grandma's Bag of Stories – Sudha Murthy – Penguin Random House, India.				
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.				

13/2/24
HOD

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SEMESTER - II	DISCRETE MATHEMATICS											L	T	P	J	C
U23MAT202D	Common to COMPUTER SCIENCE AND ENGINEERING, CSE(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING) & COMPUTER SCIENCE AND DESIGN											3	1	0	0	4
Course Outcomes																
At the end of the course, the student will be able to																
CO1:	check the validity of the arguments in the field of data base and artificial intelligence using the rules of logic.															
CO2:	apply the concept of logical theory to validate the correctness of software specifications.															
CO3:	analyze and simplify the digital (logic) circuits using the concept of relations.															
CO4:	apply the concept of various types of functions in the field of sorting algorithm, parallel computing and image processing,															
CO5:	apply the concepts of group theory in the field of coding theory and cryptography.															
Pre-requisites:																
<ul style="list-style-type: none">Fundamentals of elementary algebraFundamentals of calculus											<ul style="list-style-type: none">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)															
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	3	3		3	2							2		2	3	
CO2	3	3		3	2							2		2	3	
CO3	3	3		3	2							2		2	3	
CO4	3	3		3	2							2		2	3	
CO5	3	3		3	2							2		2	3	
Course assessment methods [Theory with tutorial course]																
Direct											Indirect					
CIE test I (8) (Theory)					Attendance (5)						Course end survey					
CIE test II (8) (Theory)					Assignment/Quiz/Seminar (5)											
CIE test III (8) (Theory)					Total CIE: 40 marks											
Objectives Test (6)					Semester End Examination: 60marks											
Unit 01	PROPOSITIONAL CALCULUS														12 Hours	
Proposition (statement) – Simple (atomic / primitive) and Compound propositions – Logical connectives / operators (negation, conjunction, disjunction, negation of compound propositions, conditional and bi conditional propositions, converse, contra positive and inverse) – Truth tables – Tautology and contradiction – Logical equivalences and implications (consequences) – De Morgan’s laws – Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments – Validity of arguments by truth table technique and rules of inference – Methods of proof (direct and indirect).																

Unit 02	PREDICATE CALCULUS				12 Hours
Predicates – Propositional (Statement) function – Quantifiers (Universal and Existential quantifiers) – Variables – Free and bound variables – Scope of the formula — Negation – Logical equivalences and implications for quantified statements – Theory of inference – Rules of universal specification and generalization – Rules of existential specification and generalization – Validity of arguments.					
Unit 03	RELATIONS				12 Hours
Relations – domain and range of a relation - Types of relations (reflexive, symmetric, transitive, antisymmetric irreflexive relation) and their properties – Relation matrix – Graph of a relation - Partition of a set - Equivalence relations – Equivalence Classes – Quotient set – Partial order relation - Poset – Hasse diagram.					
Unit 04	FUNCTIONS				12 Hours
Functions – Classification of functions (algebraic and transcendental) – Types of functions (injective, surjective and bijective) – Composition of functions and its properties (statement only) – Inverse functions – Characteristic function of a set and its properties (with proof) - Permutation functions.					
Unit 05	GROUPS AND GROUP CODES				12 Hours
Algebraic structures – Groups – Cyclic groups – Subgroups – Group homomorphism – Normal subgroups and Cosets – Lagrange's theorem — Codes and group codes – Basic notions of error detection and error correction.					
Theory: 45 Hrs		Tutorial: - 15		Practical: -	Project:--
				Total Hours: 60 Hrs	
TEXT BOOK:					
1.	T. Veerarajan, "Discrete Mathematics", McGraw Hill Publishers, 1 st Edition, 21 st Reprint, 2015.				
REFERENCE BOOKS:					
1.	J. P. Trembly and R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill Publishers, 1 st Edition, 2017.				
2.	K. H. Rosen, "Discrete Mathematics and Its Applications", McGraw Hill Publishers, 8 th Edition, 2019.				
3.	B. Kolman, R. C. Busby and S. C. Ross, "Discrete Mathematical Structures", Pearson Publishers, 6 th Edition, 2006.				
 Dr. S. JAYABHARATHI ASSOCIATE PROFESSOR & HEAD DEPARTMENT OF MATHEMATICS, SONA COLLEGE OF TECHNOLOGY, SALEM-636 005, Tamilnadu. Ph: 0427 - 4099999.					
BoS Date: 08. 07. 2023		HoD / Mathematics			

U23CHE204C	APPLIED CHEMISTRY (Common to B.E. CSE (AIML) and CSD)						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:	Outline the principle of electrochemistry and its engineering applications.													
CO2:	Describe the construction, working principle and applications of energy storage devices for electronic appliances.													
CO3:	Analyze the types of polymers, polymerization reactions, polymerization techniques and fabrication methods of polymers for engineering applications.													
CO4:	Discuss the principle, advantages and applications of organic electronic materials in electronic devices.													
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	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2					2						3	3
CO2	2	2					2						2	3
CO3	3	2					2						3	3
CO4	3	3					2						3	2
CO5	3	3					3						3	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: ELECTROCHEMISTRY										6 Hours				
Introduction – basic terminologies - electrode potential – Nernst Equation – derivation and problems based on single electrode potential calculation – reference electrodes – types and examples – Ion selective electrode – glass electrode – measurement of pH – electrochemical series – significance – electrolytic and electrochemical cells – EMF – measurement of emf – potentiometric titrations (redox – Fe ²⁺ vs dichromate) – conductometric titrations (acid-base – HCl vs NaOH).														

Unit 02: CHEMISTRY OF ENERGY STORAGE DEVICES				6 Hours	
Reversible and irreversible Cells – Batteries - types of batteries – Fabrication and working of alkaline battery-Lead-acid battery-Ni-Cd-Lithium ion batteries and Solar cells – Fuel Cells – Hydrogen-Oxygen fuel cell – Nano batteries- construction-working-advantages and applications.					
Unit 03: POLYMER CHEMISTRY				6 Hours	
Introduction to Polymers – classification of polymers - functionality – tacticity, degree of polymersation, glass transition temperature in polymers - types of polymerization-addition-condensation and copolymerization – free radical mechanism of addition polymerization – Plastics – moulding constituents of plastic – moulding of plastics into articles-Injection and Compression moulding – Thermoplastic and Thermosetting Resins.					
Unit 04: CHEMISTRY OF ORGANIC ELECTRONIC MATERIALS				6 Hours	
Conducting polymers, types and conducting mechanism - Organic semiconducting materials – working principle and advantages over inorganic semiconducting materials - p-type and n-type organic semiconducting materials - Pentacene Fullerenes-C-60 – Organic dielectric material-definition-working principle and examples - Polystyrene – PMMA – – Organic Light Emitting Diodes (OLEDs) - construction-working principle and applications – Organic transistors- construction-working principle and applications.					
Unit 05: E-WASTE MANAGEMENT				6 Hours	
Introduction-E-Waste – definition – sources of e-waste– hazardous substances in e-waste – effects of E-waste on environment and human health- need for E-waste management– E-waste handling rules - waste minimization techniques for managing E-waste – extraction of gold and copper from printed circuit boards (PCBs) - recycling of E-waste – disposal treatment methods of E – waste.					
Theory: 30 Hrs		Tutorial: 0	Practical: 0	Project:0	Total Hours: 30 Hrs
TEXT BOOKS					
1.	P.C Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co., New Delhi , 17th Edition, 2018.				
2.	Wiley Editorial Board, “Wiley Engineering Chemistry”, 2nd Edition, Wiley India Pvt.Ltd, New Delhi, Reprint 2019.				
REFERENCES					
1.	Gowariker V.R. , Viswanathan N.V. and Jayadev Sreedhar, “Polymer Science”, New Age International P (Ltd.), Chennai, 2006.				
2.	Stergios Logothetidis "Handbook of Flexible Organic Electronics Materials - Manufacturing and Applications", WoodHead publishing., 1st edition, London, 2015. .				

3.	Sam-Shajing Sun, Larry R. Dalton "Introduction to Organic Electronic and Optoelectronic Materials and Devices", CRC press., 2nd edition, London, 2017.
4.	Majeti Narasimha Var Prasad, Meththika Vithanage, Anwesha Borthakur, "Handbook of Electronic Waste Management", 1st edition - November 21, 2019.

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21.11.24

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C. Shanthi
12.1.2024

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U23CPR205	PROGRAMMING IN C (Common to CSE, CSE(AIML), CSD, ADS, IT and ECE 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 (8)	Objectives Test (6)	Course end survey
CIE test II (8)	Attendance (5)	
CIE test III (8)	Total CIE: 40 marks	
Assignment/seminar/Quiz (5)	Semester End Examination (60)	

Unit 01: C PROGRAMMING BASICS

9 Hours

Structure of a C program - C Character set, Identifiers 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

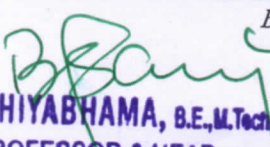
9 Hours

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


12.1.2024 Version 1.0


Semester II

B.E / B.Tech Regulations 2023



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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.				

U23BEE206B	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING (Common to CSD & CSE(AI & ML))									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 basic circuit laws and find the DC circuit parameters.													
CO2:	Analyse the AC circuits and determine the various parameters of AC circuits.													
CO3:	Explain the construction and working principle of Electrical machines and Transformer.													
CO4:	Describe the working principles and characteristics of semiconductor devices.													
CO5:	Describe the working principles of operational amplifiers and UPS with applications.													
Pre-requisite:														
Physics														
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	2		3	2	2	2	3		1	2	3	3
CO2	3	3	2		3	2	2	2	3		1	2	3	3
CO3	2	3	2		2	2	2	2	3		1	2	3	3
CO4	2	3	2		2	2	2	2	3		1	3	3	3
CO5	2	3	2		2	2	2	2	3		1	3	3	3
Course Assessment methods														
Direct										Indirect				
CIE test I (8)					Objectives Test (6)					Course end survey				
CIE test II (8)					Attendance (5)									
CIE test III (8)					Total CIE: 40 marks									
Assignment/seminar/Quiz (5)					Semester End Examination (60)									
Unit 01: DC FUNDAMENTALS												9 Hours		
Electrical components and parameters – Resistance, Conductance – Ohm’s law – Kirchhoff’s law – Resistors in series and parallel – Comparison of series and parallel circuits – Star-Delta transformation.														
Unit 02: AC FUNDAMENTALS												9 Hours		
AC waveforms – standard terminologies – RMS and average values of Sinusoidal, Triangular and Square waveforms – Form factor, Peak factor – Resistance, Inductance, Capacitance in AC circuits – Impedance – RL, RC, RLC series circuits.														
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Unit 03: ELECTRICAL MACHINES				9 Hours
DC Generator: Construction and Working principle - EMF equation, Types and Applications. DC Motor: Working Principle of DC motor, Types and Applications. Single Phase Transformer: Construction, Working principle and Applications.				
Unit 04: SEMICONDUCTOR DEVICES				9 Hours
Introduction to semiconductors – PN junction diode, Zener diode, BJT - Operations of NPN and PNP Transistors – Characteristics of Transistors in CE, CB and CC configuration, SCR, MOSFET, I-V characteristics. Diode Rectifiers: Working principle of half wave rectifier, Full wave rectifier, and Bridge rectifier.				
Unit 05: POWER SUPPLY AND OPERATIONAL AMPLIFIERS				9 Hours
UPS: Components of UPS – Working principle of UPS – Types of UPS - Applications. SMPS - Block diagram- Principle of operation – Applications. Operational Amplifier: Ideal characteristics of Op-Amp – Inverting amplifier, non-Inverting amplifier – Voltage follower – Summing amplifier.				
Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs
TEXT BOOKS				
1. B.L. Theraja, “Fundamentals of Electrical Engineering & Electronics”, S. Chand & Co Ltd, 28 th Edition 2018				
2. J.B. Gupta, “Fundamentals of Electrical and Electronics Engineering”, Revised edition 2012, S.K. Kataria & Sons.				
REFERENCES				
1. Mehta V.K, Rohit Mehta, “Principles of Electrical Engineering & Electronics”, S.Chand& Co. Ltd., 2016.				
2. D. Roy Choudhury and Shail Jain, “Linear Integrated Circuits”, sixth edition, New age international, 2021.				
3. S. Padma, C. Santhana Lakshmi, S. Purushotham, “Basic Electrical and Electronics Engineering”, Sonaversity, Revised edition 2016.				
4. P S Subramaniam, “Basic concepts of Electrical and Electronics Engineering “, BS Publications, I Edition, 2016.				


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U23EC203	DIGITAL PRINCIPLES AND SYSTEM DESIGN (COMMON TO B.E CSE,AIIML,CSD)					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 number systems, logic gates and simplify Boolean expressions													
CO2:	Design of combinational logic circuits													
CO3:	Design of sequential logic circuits													
CO4:	Design and implement shift registers and counters.													
CO5:	Implementation of combinational circuits using Programmable Logic 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	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	2	2	1	1		2	3	3	3
CO2	3	3	3	3	3	2	2	1	1		2	3	3	3
CO3	3	3	3	3	3	2	2	1	1		2	3	3	3
CO4	3	3	3	3	3	2	2	1	1		2	3	3	3
CO5	3	3	3	3	3	2	2	1	1		2	3	3	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: BOOLEAN ALGEBRA AND LOGIC GATES											9 Hours			
Review of Number systems – Boolean Algebra – Boolean postulates and theorems- Digital Logic Gates - NAND and NOR Implementation –SOP and POS - Simplification of Boolean functions using K-Map Method – Four Variable K-map – POS Simplification – Don't Care Conditions – Quine McCluskey method.														
Unit 02: COMBINATIONAL LOGIC CIRCUITS											9 Hours			

Design of Half and Full Adders, Half and Full Subtractors – Parallel Adders and Subtractors – BCD Adder – Code converters: BCD to XS-3, XS-3 to BCD - Magnitude Comparator – Decoders – Encoders – Multiplexers – Demultiplexers - Design of ALU using adders - Introduction to Verilog HDL - Verilog HDL for 2 – bit adder – 2:1 multiplexer.					
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 – State Diagram – State Table – State Reduction and Assignment.					
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: MEMORY AND PROGRAMMABLE LOGIC				9 Hours	
Classification of memories: RAM - Static and Dynamic RAM, ROM - PROM, EPROM, EEPROM - Design of Memory using flip-flops ,Implementation of combinational logic using PROM - Programmable Logic Array – Programmable Array Logic.					
Theory: 45 Hrs		Tutorial: --	Practical: --	Project:--	Total Hours: 45 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.	S. Salivahanan and S. Arivazhagan, “Digital Circuits And Design”, Oxford University Press, Fifth edition, 2018.				
REFERENCES					
1.	A.Anandkumar, ‘Fundamentals of digital circuits, 4 th Edition, Prentice Hall India, Paper back’2016.				
2.	John F Wakerly – ‘Digital Design Principles and Practices’, 4 th Edition, Prentice Hall India, 2008.				


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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)		Total CIE: 100 marks		Course end survey			
CIE test II (30)		Semester End Examination: NIL					
CIE test III (40)							
Unit 01: WEAVING AND CERAMIC TECHNOLOGY							3 Hours
அலகு I நெசவு மற்றும் பாணைத் தொழில்நுட்பம்: சங்க காலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் பாண்டங்களில் கீறல் குறியீடுகள்.							
Unit 02: DESIGN AND CONSTRUCTION TECHNOLOGY							3 Hours
அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்: 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: கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - கடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.							
Unit 04: AGRICULTURE AND IRRIGATION TECHNOLOGY							3 Hours
அலகு IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்: அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குழுவித் 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: 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.	கண்ணித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்). கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) பொருதை - 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

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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)		Total CIE: 100 marks		Course end survey		
CIE test II (30)		Semester End Examination: NIL				
CIE test III (40)						
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 Thoempu 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). கலைக்கலை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) பொருளை –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 Civilization 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

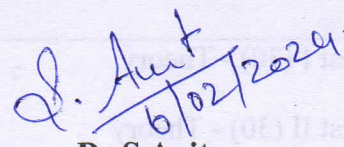
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	Total CIE: 100 marks Semester End Examination – NIL	Course end survey
CIE test II (30) - Theory		
CIE test III (40) – Theory		

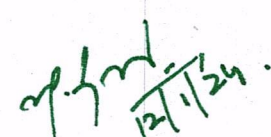
Unit 01					6 Hours
Percentage: Conversion of a Percentage into a Fraction – Conversion of a Percentage into a Ratio – Conversion of a Ratio into a Percentage - Percentage Change – Successive percentage – Problems					
Verbal Aptitude: Jumbled sentences & Reconstructions of sentences (PQRS)					
Unit 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.				


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Department of Training
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U23CHL211	CHEMISTRY LABORATORY (Common to CSE, CSE (AIML), & CSD 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:	Analyze the amount of hydrochloric acid in a given solution by pH metry and amount of hydrochloric acid and acetic acid by conductometric titration.													
CO2:	Estimate the amount of copper from discarded PCBs, determine the molecular weight of a polymer and estimation of chromium in electroplating sludge by Permanganometry.													
CO3:	Determine the amount of ferrous ion in a given solution by potentiometer, determine the iron content in water by spectrophotometric method and estimate the amount of hardness, alkalinity present in house hold water by volumetric method.													
Pre-requisite:														
Capable of handling burette, pipette, beaker, conical flask and standard measuring flask.														
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		1		1			1					2
CO2	3	2		1		1	1		1					2
CO3	3	2		1		1	1		1					2
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	Estimation of HCl acid by pH metry.													
2	Estimation of HCl by conductometry. (HCl vs NaOH)													

3	Estimation of mixture of acids by conductometry. (HCl + CH ₃ COOH vs NaOH)	
4	Estimation of ferrous ion by potentiometric titration.	
5	Estimation of copper content from discarded PCBs by EDTA method.	
6	Determination of molecular weight of a polymer by viscosity measurements.	
7	Estimation of hardness of water sample by EDTA method.	
8	Estimation of alkalinity of water sample by indicator method.	
9	Estimation of chromium prepared from electroplating sludge by Permanganometry.	
10	Determination of iron content in water by spectrophotometric method.	
		TOTAL : 30 HOURS


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 SALEM - 636

U23CPL212	C PROGRAMMING LABORATORY (Common to ADS, IT, CSE, CSE(AIML), CSD and ECE 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	PO9	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)	RTPS (10)	Course end survey
Quiz I- (5)	Record (10)	
CIE test II (15)	Total CIE: 60 marks	
Quiz II- (5)	Semester End Examination (40 marks)	

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 Hrs	Tutorial: 0	Practical: 30 Hrs	Project: 0	Total Hours: 30 Hrs
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U23BEEL213B	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY (Common to CSD & CSE(AI & ML))	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:	Apply the basic circuit laws and calculate various parameters of DC and AC circuits.
CO2:	Analyse the performance characteristics of electronic devices, DC Motor and Single Phase transformer.
CO3:	Apply the basic concepts of electrical and electronics for real time problem solving.

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
CO 1	3		2			3	2		3		3	3	3	3
CO 2	2	2	2		3				3		2	3	2	3
CO 3	3	2	2		3				3		2	3	3	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: 60 marks Semester End Examination (40 marks)	Course end survey

LIST OF EXPERIMENTS

1. Verification of Ohm's Law and Kirchhoff's Law.
2. Measurement of power and power factor for RLC series circuit.
3. Characteristics of PN Junction Diode and Zener Diode.
4. Characteristics of BJT in CB and CE Configurations.
5. Characteristics of SCR
6. Characteristics of MOSFET.
7. Measurement of ripple factor for half wave and full wave rectifier circuits.
8. Characteristics of operational amplifier as inverting and non-inverting amplifiers.
9. Load test on shunt motor.
10. Load test on single phase transformer.
11. Line and load regulation of SMPS.

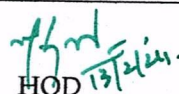
Theory: --	Tutorial: --	Practical: 30 Hrs	Project:--	Total Hours: 30 Hrs
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U23OL1201	French - II		L	T	P	J	C
			1	0	0	0	1
Course Outcomes							
At the end of the course, the student will be able to							
CO1:	Accept and refuse of an invitation, give 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)		Total CIE: 100 marks		Course end survey			
CIE test II (30)		Semester End Examination: NIL					
CIE test III (40)							
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, cahier d'activités)						
3.	Reference books : La conjugaison, Dondon, Echo						

HOD

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

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

HOD

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Professor & Head,
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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)			Total CIE: 100 marks Semester End Examination: NIL		Course end survey			
CIE test II (30)								
CIE test III (40)								
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							

Dr. M. Renuga
13/2/24
HOD

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