

SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.E- Mechatronics Engineering

CURRICULUM and SYLLABI

[For students admitted in 2023-2024]

B.E / B.Tech Regulations 2023

Approved by BOS and Academic Council meetings

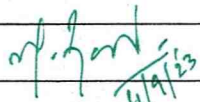
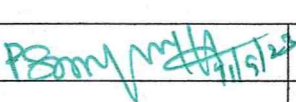
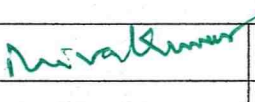
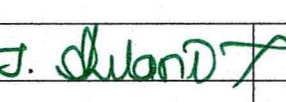
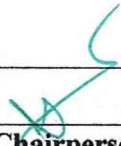
Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: Mechatronics Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*	
Theory courses											
1.	U23ENG101A	Communication Skills in English	2	0	2	0	3	HS	60	TL	
2.	U23MAT102A	Linear Algebra and Calculus with MATLAB	3	0	2	0	4	BS	75	TL	
3.	U23PHY103C	Physics for Engineers	3	0	0	0	3	BS	45	T	
4.	U23CHE104F	Engineering Chemistry	2	0	0	0	2	BS	30	T	
5.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T	
6.	U23EGR107	Engineering Graphics	3	0	0	0	3	ES	45	T	
7.	U23TAM101	தமிழர் மரபு /Heritage of Tamils	1	0	0	0	1	HS	15	T	
8.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T	
Practical courses											
9.	U23PCL108	Physics and Chemistry Laboratory	0	0	2	0	1	BS	30	L	
10.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L	
Total Credits							21				
Optional Language Courses**											
11.	U23OL1101	French	1	0	0	0	1	OL	15	T	
12.	U23OL1102	German							15	T	
13.	U23OL1103	Japanese							15	T	
14.	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, MCT BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.P.Suresh	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/ Mechatronics Engineering, First Semester B.E.MCT Students and Staff, COE

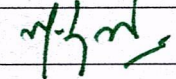
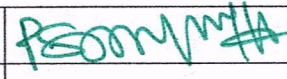
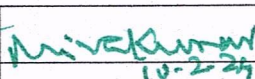
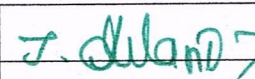
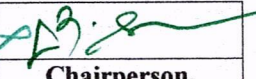
Sona College of Technology, Salem
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Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: Mechatronics Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*	
Theory courses											
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T	
2.	U23MAT202C	Vector Calculus and Differential Equations	3	1	0	0	4	BS	60	TT	
3.	U23PHY203G	Physics of Electronic Devices	2	0	0	0	2	BS	30	T	
4.	U23CHE204D	Materials Chemistry	3	0	0	0	3	BS	45	T	
5.	U23MC201	Engineering Mechanics-Statics and Dynamics	3	0	0	0	3	ES	45	T	
6.	U23MC202	Basic Electrical Engineering	3	0	0	0	3	ES	45	T	
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	0	1	HS	15	T	
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T	
Practical courses											
9.	U23WPL214	Workshop Practice	0	0	2	0	1	ES	30	L	
10.	U23MC203	Basic Electrical Engineering and Devices Laboratory	0	0	4	0	2	ES	60	L	
Total Credits							21				
Optional Language Courses**											
11.	U23OL1201	French-II	1	0	0	0	1	OL	15	T	
12.	U23OL1202	German-II							15	T	
13.	U23OL1203	Japanese-II							15	T	
14.	U23OL1204	Korean-II							15	T	

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Dr.M.Renuga	Dr.P.Suresh	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

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HOD/ Mechatronics, Second Semester B.E. Mechatronics Students and Staff, COE

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SONA COLLEGE OF TECHNOLOGY
SALEM-636 005

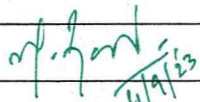
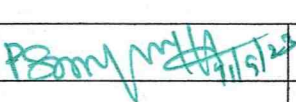
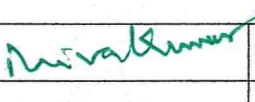
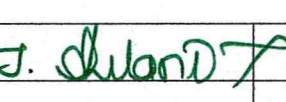
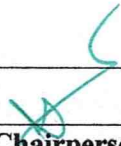
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8.	U23GE101	Basic Aptitude-I	2	0	0	0	0	AC	30	T	
Practical courses											
9.	U23PCL108	Physics and Chemistry Laboratory	0	0	2	0	1	BS	30	L	
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U23ENG101A	Communication Skills in English (Common to ADS, AIML, BME, CSD, CSE, CIVIL, ECE, EEE, MCT, FT, IT Branches)					L	T	P	J	C				
						2	0	2	0	3				
Course Outcomes														
At the end of the course, the student will be able to														
CO1:	Use grammatical components effectively in both written and spoken communication													
CO2:	Develop speaking skills for self-introduction, delivering speeches and technical presentation													
CO3:	Demonstrate effective listening skills for academic and professional purposes													
CO4:	Write emails and formal letters and build resumes and construct paragraphs													
CO5:	Develop speaking skills both in terms of fluency and comprehensibility													
Pre-requisite:														
<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 														

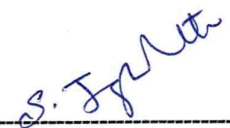
Unit 02:				6 Hours					
<ul style="list-style-type: none"> • Tenses, Sentence Patterns • Instructions • Letter Writing - calling for quotations, placing orders 									
Unit 03:				6 Hours					
<ul style="list-style-type: none"> • Prefixes and Suffixes • Cover letter and resume writing 									
Unit 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 									
Lab component:									
<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 form 5. Loud Reading 									
Theory: 30 Hrs		Tutorial: --		Practical: 30 hours-		Project:--		Total Hours: 60 Hrs	
TEXT BOOKS									
1. Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016									
2. Extensive Reading									
<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 Jaico 3. The Story of Amazon.com- Sara Gilbert, published by Jaico 									
REFERENCES									
1. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.									
2. A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.									


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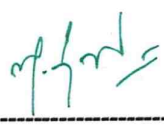
Dr. M. RENUGA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology,
SALEM - 6

B. E. / MECHATRONICS ENGINEERING																				
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 algebra Fundamentals of calculus 							<ul style="list-style-type: none"> Fundamentals of geometry Fundamentals of trigonometry 													
CO/PO, PSO Mapping																				
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak																				
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)																			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2						
CO1	3	3		3	2						3	2	3	3						
CO2	3	3		3	2						3	2	3	3						
CO3	3	3		3	2						3	2	3	3						
CO4	3	3		3	2						3	2	3	3						
CO5	3	3		3	2						3	2	3	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.	



Dr. S. JAYABHARATHI
 Head / Department of Mathematics
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Dr. M. RENUGA
 BoS - Chairperson
 Science and Humanities
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BoS Date: 08. 07. 2023

Dr. S. JAYABHARATHI
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B.E./B.Tech Regulations 2023
Dr. M. RENUGA
 Professor & Head,
 Department of Humanities & Languages,
 Sona College of Technology,
 SALEM - 636 005.

U23PHY103C	PHYSICS FOR ENGINEERS				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:	Distinguish the types of magnetic materials.													
CO5:	Elucidate the different modes of heat transfer.													
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	2	-	3
CO2	3	2	-	-	-	2	2	-	-	2	2	2	-	3
CO3	3	2	-	-	-	2	2	-	-	2	2	2	-	3
CO4	3	2	-	-	-	2	2	-	-	2	2	2	-	3
CO5	3	2	-	-	-	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) - Seven crystal systems and fourteen 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 and 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 - Particle nature of radiation - Compton effect - Expression for Compton shift (no derivation) - Wave nature of matter - de Broglie waves - Heisenberg's Uncertainty principle - Schrödinger'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 - normal population - Stimulated absorption - population inversion - meta stable state - spontaneous emission - stimulated emission - Basic components of a laser - Einstein's theory of spontaneous and stimulated emission of radiation - Types of lasers - Solid state laser - Nd:YAG laser - Gas laser - CO ₂ laser - Semiconductor laser - Homojunction and hetero junction laser - Holography - Construction and reconstruction of hologram - Application of laser in industry - Cutting, welding and drilling - Medical applications - Lasik.				
Unit 04: MAGNETIC MATERIALS				9 Hours
Basic definitions - Magnetic moment - Magnetic field - Magnetic field intensity - Magnetic permeability - Magnetization - Intensity of magnetization - Magnetic susceptibility - Types of magnetic materials - Dia, Para and Ferromagnetic materials - Domain theory of ferromagnetism - Origin of domains - Antiferromagnetic materials - Ferrites - Structure, properties and applications - Hysteresis - Hard and soft magnetic materials.				
Unit 05: THERMAL PHYSICS				9 Hours
Heat and temperature - Modes of heat transfer - Conduction, convection and radiation - Specific heat capacity - Thermal capacity and coefficient of linear thermal expansion - Thermal conductivity - Measurement of thermal conductivity of a good conductor - Forbe's method - Measurement of thermal conductivity of a bad conductor - Lee's disc method - Radial flow of heat - Cylindrical flow of heat - Practical applications of conduction of heat - Thermal radiations - Properties and applications of thermal radiations.				
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.	Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill (Indian Edition), 2017.
4.	R. Murugesan, Kiruthiga Sivaprasath, "Thermal Physics", S.Chand & Company Ltd, New Delhi 2018.
5.	R.Wolfson, "Essential University Physics", Volume 1 & 2. Pearson Education (Indian Edition), 2009.

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U23CHE104F		ENGINEERING CHEMISTRY					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:	Analyse the impurities of water, their removal methods and explain the conditioning methods for industrial uses.													
CO2:	Outline the principles and applications of electrochemistry to engineering and technology.													
CO3:	Analyse the types of corrosion and describe the methods of corrosion control.													
CO4:	Discuss the principle and applications of surface chemistry and catalysis in engineering and technology.													
CO5:	Describe the basics of nano chemistry, synthesis, properties and applications of nano materials in engineering and technology.													
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					3							2
CO2	3	2												2
CO3	3	2					2							2
CO4	3	2												2
CO5	3	2					1							2
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: WATER TECHNOLOGY										6 Hours				
Introduction - Characteristics - hardness - estimation of hardness by EDTA method, alkalinity and its estimation - Boiler feed water - requirements - disadvantages of using hard water in boilers - internal conditioning (colloidal, phosphate, calgon and carbonate conditioning methods) - external conditioning - demineralization process, desalination of brackish water by reverse osmosis.														
Unit 02: ELECTROCHEMISTRY										6 Hours				
Electrode potential - Nernst Equation - derivation and problems based on single electrode potential														

calculation - reference electrodes – definition and examples only – Ion selective electrode - glass electrode - measurement of pH – electrochemical series – significance – electrolytic and electrochemical cells – reversible and irreversible cells – potentiometric titration (redox – Fe²⁺ vs dichromate) – conductometric titration (acid-base – HCl vs NaOH).

Unit 03: CORROSION AND CORROSION CONTROL

6 Hours

Chemical corrosion - Pilling-Bedworth rule – electrochemical corrosion – mechanism - galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – sacrificial anode and impressed cathodic current methods – corrosion inhibitors – protective coatings – Paints - constituents and their functions.

Unit 04: SURFACE CHEMISTRY AND CATALYSIS

6 Hours

Adsorption-types-physical and chemical adsorption – adsorption of gases on solids-adsorption isotherms-Freundlich and Langmuir isotherms-adsorption of solutes from solution – applications of adsorption-role of adsorption in catalytic reactions – granular activated carbon in pollution abatement – catalysis - types - homogeneous and heterogeneous catalysis.

Unit 05: NANOCHEMISTRY

6 Hours

Basics - distinction between molecules, nanoparticles and bulk materials – size-dependent properties – nanoparticles: nano cluster, nano rod, nanotube (CNT) and nanowire – Synthesis: precipitation – hydrothermal – solvothermal – chemical vapour deposition - sol-gel technique – properties and applications of nano materials.

Theory: 30 Hrs

Tutorial: --

Practical: --

Project: --

Total Hours: 30 Hrs

TEXT BOOKS

1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi, 2018 (17th Edition).
2. Wiley Editorial Board, "Wiley Engineering Chemistry", 2nd Edition, Wiley India Pvt.Ltd, New Delhi, Reprint 2019.

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1. H.K. Chopra, A. Parmer, "Chemistry for Engineers", Narosa Publishing House, New Delhi, 110002, 2016.
2. Kannan P., Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2009.
3. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 2008.
4. Ozin G. A. and Arsenault A. C., "Nanotechnology: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.

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Programme:

BE/B.Tech Regulations 2023

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U23PCL108	PHYSICS AND CHEMISTRY LABORATORY (For Mechatronics Engineering)	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 properties of materials by applying the principles of optics and thermal Physics. |
| CO2: | Identify hardness and suggest the quality of water suitable for domestic purpose and analyse the concentration of carbonate, bicarbonate and hydroxide present in the given sample of water. |
| CO3: | Determine the thickness of the given wire used for household applications and the amount hardness present in the household water sample. |

Pre-requisite: Capable of using Screw gauge, Vernier calliper, Travelling microscope and Spectrometer.

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		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 (Physics part)

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 wavelength of laser, acceptance angle and numerical aperture of an optical fibre using diode laser.
4	Determination of particle size of lycopodium powder using diode laser.

5	Determination of dispersive power of the prism for various pairs of colors in the mercury spectrum using a spectrometer.
LIST OF EXPERIMENTS (Chemistry part)	
6	Estimation of hardness of water sample by EDTA method.
7	Estimation of alkalinity of water sample by indicator method.
8	Estimation of HCl by pH metry.
9	Estimation of HCl by conductometry. (HCl vs NaOH)
10	Estimation of ferrous ion by potentiometric titration.
TOTAL : 30 HOURS	

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U23PPR105	PROBLEM SOLVING USING PYTHON PROGRAMMING					L	T	P	J	C				
	(Common to ADS, IT, CSE, CSE(AIML), 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						L	T	P	J	C						
	(Common to ADS, IT, CSE, CSE(AI ML), CSD, CIVIL, BME, ECE, EEE, MECH and MCT Branches)						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	PO9	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																	
<ol style="list-style-type: none"> 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 Involutes.													
CO2:	Draw the projection of Point, Line and Plane surfaces.													
CO3:	Draw the projection of simple solids by rotating object method.													
CO4:	Develop the section of simple solids and lateral surface of truncated solids.													
CO5:	Draw the isometric view to orthographic projection.													
Pre-requisite: Nil														
CO/PO, PSO Mapping (3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	1							3		2			1	
CO2					3			2		2		2		2
CO3					3			2		2		2	1	2
CO4					3			2		2		2	1	2
CO5			2					2		2		2	1	
Course Assessment methods														
Direct						Indirect								
CIE test I (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). Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.											9 Hours			
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.				

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1.	BasantAgarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2.	Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27thEdition, 2017.
3.	Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4.	Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5.	Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
6.	Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.



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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 சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.						
அலகு 2 : மரபு – பாறை ஓவியங்கள் முதல் ஓவியங்கள் வரை – சிற்பக் கலை					3 Hours	
நடுகல் முதல் சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை- சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் 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 பிறப்புகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள் கையெழுத்துப்படிக்கள் - 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 -ஆற்றங்கரை 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 வரலாறு – மக்களும் பண் பொடும் – மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).								
2	கணிணித ஂ தமிழ் – முமனவர ஂஇல. சுந்தரம் . (விகடன் பிரசுரம்).								

3	கீழடி – மவமக நதிக்கமரயில் ெங்ககொல நகர நொகரிகம் (ததொல்லியல் துமறதவளியீடு)
4	பொருமந – ஆற்றங்கமர நொகரிகம். (ததொல்லியல் துமற தவளியீடு)
5	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies
7	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9	Keeladi - 'Sangam City 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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U23GE101	BASIC APTITUDE-1	L	T	P	J	C
		2	0	0	0	0

Course Outcomes

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

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

Pre-requisite:

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

CO/PO, PSO Mapping

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

COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	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
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.			

S. Anita
15/09/2023


Dr.S.Anita
Head/Training
Dr. S. ANITA
Professor and Head
Department of Training,
SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005.

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) CIE test II (30) CIE test III (40)					Total CIE: 100 marks Semester End Examination: NIL Course end survey				
Unit 01:								3 Hours	
Hr 2: Alphabets, Basic wishes, self-introduction, basic verbs: avoir and être Hr 4: Nationalities and countries, colors, days & months Hr 6: Definite articles, numbers 0-20, write about one's identification									
Unit 02:								3 Hours	
Hr 8: Professions, conjugation: 1 st group verbs, indefinite articles Hr 10: Preposition of place, identity card, negative sentence Hr 12: Things around us, subjective and ephatic 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								


M. Renuga
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) CIE test II (30) CIE test III (40)					Total CIE: 100 marks Semester End Examination: NIL Course end survey				
Unit 01:								3 Hours	
<ul style="list-style-type: none"> Greeting and taking leave, introducing oneself, introducing others 									
Unit 02:								3 Hours	
<ul style="list-style-type: none"> Alphabets, spelling, numbers 									
Unit 03:								3 Hours	
<ul style="list-style-type: none"> Age, Telephone/mobile numbers, Month, Date, Time 									
Unit 04:								3 Hours	
<ul style="list-style-type: none"> Languages, Family, Asking/giving information about family members 									
Unit 05:								3 Hours	
<ul style="list-style-type: none"> Hobbies, Professions 									
Theory: 15 Hrs		Tutorial: --		Practical: --		Project:--		Total Hours: 15 Hrs	
TEXT BOOKS									
1. Netzwerk A1									


HOD
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SALEM - 637 002

U23OL1103		Japanese					L	T	P	J	C
							1	0	0	0	1
Course Outcomes											
At the end of the course, the student will be able to											
CO1:	Use words and phrases of greeting in Japanese, write the letters of the alphabet, identify names of objects and do a self-introduction using short and simple sentences										
CO2:	Demonstrate the use of time-related words and verb conjunctions and make light conversation asking for directions and answering questions										
CO3:	Use different kinds of verbs through the day and those used for giving things, and demonstrate the use of adjectives										
CO4:	Express liking for the Japanese language, describe the locations of different things and demonstrate counting in Japanese										
CO5:	Make comparisons of stated things, express a willingness to go to Japan and use 'Te-form' verbs										
Course Assessment methods											
Direct						Indirect					
CIE test I (30) CIE test II (30) CIE test III (40)						Total CIE: 100 marks Semester End Examination: NIL Course end survey					
Unit 01:								3 Hours			
Hr 1-2: Greeting words and phrases; the Japanese alphabet: 104 Hiragana and 104 Katakana letters Hr 3-4: Identifying words from pictures or objects shown Hr 5-6: Self-introduction											
Unit 02:								3 Hours			
Hr 7-8: Asking for directions when shopping Hr 9-10: Time words and Verb Conjugations Hr 11-12: Making light conversation											
Unit 03:								3 Hours			
Hr 13-14: Expressions to use verbs from morning to night Hr 15-16: Verbs used for giving things Hr 17-18: Adjectives											
Unit 04:								3 Hours			
Hr 19-20: Ways to show liking for the Japanese language Hr 21-22: Describing the location of things (or where things are) Hr 23-24: Japanese numbers and counting											
Unit 05:								3 Hours			
Hr 25-26: Making comparisons Hr 27-28: Expressions wishing for something, like 'I want to go to Japan ...!' Hr 29-30: Using 'Te-form' Verb											
Theory: 15 Hrs		Tutorial: --		Practical: --		Project:--		Total Hours: 15 Hrs			
TEXT BOOKS											
1.	The course faculty will provide handouts / notes / course material.										
2.	Books on Basic Japanese language available in the college library.										


HOD
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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								

(Signature)
HOD

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Department of Humanities & Languages,
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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)

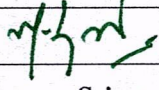
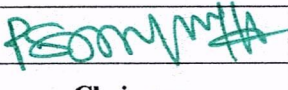
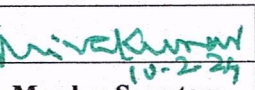
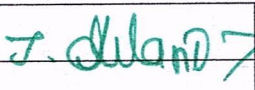
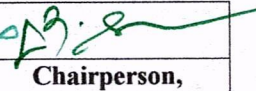
Branch: Mechatronics Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T
2.	U23MAT202C	Vector Calculus and Differential Equations	3	1	0	0	4	BS	60	TT
3.	U23PHY203G	Physics of Electronic Devices	2	0	0	0	2	BS	30	T
4.	U23CHE204D	Materials Chemistry	3	0	0	0	3	BS	45	T
5.	U23MC201	Engineering Mechanics-Statics and Dynamics	3	0	0	0	3	ES	45	T
6.	U23MC202	Basic Electrical Engineering	3	0	0	0	3	ES	45	T
7.	U23TAM201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23WPL214	Workshop Practice	0	0	2	0	1	ES	30	L
10.	U23MC203	Basic Electrical Engineering and Devices Laboratory	0	0	4	0	2	ES	60	L
							Total Credits	21		
Optional Language Courses**										
11.	U23OL1201	French-II							15	T
12.	U23OL1202	German-II							15	T
13.	U23OL1203	Japanese-II	1	0	0	0	1	OL	15	T
14.	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, Mechatronics BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.P.Suresh	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/ Mechatronics, Second Semester B.E. Mechatronics Students and Staff, COE

PRINCIPAL
SONA COLLEGE OF TECHNOLOGY
SALEM-636 005

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:

- 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	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)	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:

6 Hours


- 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 <ol style="list-style-type: none"> 1. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons 2. Discover the Diamond in You – Arindham Chaudhari – Vikas Publishing House Pvt. Ltd. 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.			


HOD 13/2/24

Dr. M. RENUGA,
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Department of Humanities & Languages,
College of Technology,
M - 62

SEMESTER - II	VECTOR CALCULUS AND DIFFERENTIAL EQUATIONS										L	T	P	J	C
U23MAT202C	Common to CIVIL, MECHANICAL and MECHATRONICS										3	1	0	0	4
Course Outcomes															
At the end of the course, the student will be able to															
CO1:	apply the concepts of vector differentiation and integration to determine the line, surface and volume integrals.														
CO2:	apply the classical methods to solve linear ordinary differential equations.														
CO3:	apply the appropriate numerical methods to solve ordinary differential equations.														
CO4:	apply the classical methods to solve partial differential equations.														
CO5:	apply the appropriate finite difference schemes to solve partial differential equations.														
Pre-requisites:															
<ul style="list-style-type: none"> Fundamentals of elementary algebra Fundamentals of calculus 								<ul style="list-style-type: none"> Fundamentals of trigonometry Fundamentals of geometry 							
CO/PO, PSO Mapping															
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2		3	2						2	2	3	3	
CO2	3	2		3	2						2	2	3	3	
CO3	3	2		3	2						2	2	3	3	
CO4	3	2		3	2						2	2	3	3	
CO5	3	2		3	2						2	2	3	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	VECTOR CALCULUS											12 Hours			
Vector differentiation: Scalar and vector valued functions – Gradient of a scalar point function - Level surface, Unit normal vector, Angle between the two surfaces, directional derivatives – Divergence of a vector point function – Solenoidal vector – Curl of a vector point function – Irrotational vector – Problems based on vector identities – Scalar potential.															
Vector integration: Line, surface and volume integrals – Statements of Green's, Stoke's and Gauss divergence theorems – Simple applications involving squares, rectangles, cubes and rectangular parallelopiped.															
Unit 02	ORDINARY DIFFERENTIAL EQUATIONS											12 Hours			
Higher order linear ordinary differential equations with constant coefficients – Cauchy's and Legendre's linear ordinary differential equations – Method of variation of parameters.															

Unit 03	NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS	12 Hours
<p>Single Step Methods: Numerical solution of first order ordinary differential equations by Taylor's series, Euler and Modified Euler and Fourth order Runge – Kutta method.</p> <p>Multi Step Methods: Numerical solution of first order ordinary differential equations by Milne's and Adam's predictor-corrector methods.</p>		
Unit 04	PARTIAL DIFFERENTIAL EQUATIONS	12 Hours
<p>Formation of partial differential equations – Lagrange's partial differential equation – Clairaut's form of partial differential equations – Second order linear partial differential equation with constant coefficients.</p>		
Unit 05	NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS	12 Hours
<p>Classification of second order partial differential equations – Finite difference schemes for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat flow equation by explicit (Bender-Schmidt's) and implicit (Crank Nicholson) methods.</p>		
Theory: 45 Hrs	Tutorial: - 15	Practical: -
Project:--	Total Hours: 60 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.	T. Veerarajan, "Numerical Methods", McGraw Hill Publishers, 1 st Edition, 2018.	
REFERENCE BOOKS:		
1.	J. Stewart, "Calculus", Cengage Publishers, 8 th Edition, 2016.	
2.	C. Prasad and R. Garg, "Advanced Engineering Mathematics", Khanna Publishers, 1 st Edition, 2018.	
3.	E. Kreyszig., "Advanced Engineering Mathematics", Wiley Publishers, 10 th Edition, Reprint, 2017.	
4.	B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44 th Edition, 2018.	
5.	B. V. Ramana, "Higher Engineering Mathematics", McGraw Hill Publishers, 29 th Reprint, 2017.	
 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	

U23PHY203G	PHYSICS OF ELECTRONIC DEVICES					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:	Differentiate the electrical and thermal conductivity of metals.													
CO2:	Elucidate the classification of semiconducting materials.													
CO3:	Discuss the applications of diode as rectifier, photodiode, LED and solar cell.													
CO4:	Explain the operation of the bipolar transistor as an amplifier.													
CO5:	Evaluate the novel properties of shape memory alloys and nanomaterials.													
Pre-requisite:														
Basic Knowledge in electronics and electricity & magnetism														
CO/PO, PSO Mapping (3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO2	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO3	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO4	3	2	-	-	-	2	2	-	-	2	-	1	-	2
CO5	3	2	-	-	-	2	2	-	-	2	-	1	-	2
Course Assessment methods														
Direct										Indirect				
CIE test I (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: CONDUCTING MATERIALS												6 Hours		
Basic definitions - Classical free electron theory of metals - Expression for electrical conductivity - Expression for thermal conductivity - Wiedemann - Franz law - Lorentz number - Drawbacks of classical free electron theory - Fermi energy and Fermi distribution function - Effect of temperature on Fermi function - Density of energy states - Carrier concentration in metals.														

Unit 02: SEMICONDUCTING MATERIALS ✓				6 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) - Hall effect - Determination of Hall coefficient - Applications.				
Unit 03: PN JUNCTION DIODE AND OPTOELECTRONIC DEVICES ✓				6 Hours
PN junction diode - Formation of p-n junction – P-n junction diode under forward and reverse bias - Application of p-n junction diode as rectifier- Half wave and Full wave rectifier - Zener diode - Zener diode as voltage regulator –Basic idea of a clipper and clamper - Optoelectronic devices - Photo diodes and its applications - Light emitting diode (LED) - Principle , construction and working - Solar cell - Principle, construction and working.				
Unit 04: BIPOLAR JUNCTION TRANSISTORS AND AMPLIFIERS ✓				6 Hours
Bipolar junction transistors – Introduction - npn and pnp transistors - Transistor biasing –Transistor currents- Transistor circuit configuration- common base configuration - common emitter configuration-Transistor action in the common base mode – Static characteristics of transistor in common emitter mode - Relation between α and β - Amplifiers - Transistor as an amplifier - Introduction to Field effect transistors (FET) - Types of field effect transistors- Junction field effect transistor (JFET).				
Unit 05: NEW ENGINEERING MATERIALS ✓				6 Hours
Shape memory alloys (SMA) - Characteristics, properties of NiTi alloy, applications, advantages and disadvantages of SMA - Nanoscience and Nanotechnology - Significance of nanoscale - Different types of nanostructures (0-D, 1-D, 2-D and 3-D) - Fabrication of nanomaterials - Ball milling and Chemical vapour deposition technique (CVD) - Carbon nanotubes - Structure, properties and applications - Fabrication - Pulsed laser deposition method.				
Theory: 30 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 30 Hrs
TEXT BOOKS				
1.	V. Raghavan, “Materials Science and Engineering: A First Course” Prentice Hall India Learning Private Limited, 6th Edison, 2015.			
2.	B.K. Pandey and S. Chaturvedi, “Engineering Physics”, Cengage Learning India Pvt. Ltd., Delhi, 2012.			

REFERENCES	
1.	"Physics for Electrical and Electronics Engineering", Sonaversity, Sona College of Technology, Salem, Revised Edition 2016.
2.	William D. Callister Jr., David G. Rethwisch, "Callister's Materials Science and Engineering", 10th Edition, Global Edition 2019.
3.	R. Wolfson, "Essential University Physics", Volume 1 & 2. Pearson Education (Indian Edition), 2009.
4.	M. Arumugam, "Materials Science", Anuradha Publications, Kumbakonam, 2006.
5.	V.K Mehta, Rohit Mehta "Principles of Electronics", S.Chand & Company Ltd, 10th Edition 2014.

Callister
12.1.2024

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M. Renuka
21/1/24

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SALEM - 636 005.

U23CHE204D	MATERIALS CHEMISTRY	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

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

CO1:	Describe the basic concepts of polymerisation reactions and analyze various types of composites for specific industrial applications based on their properties.
CO2:	Classify Nano fillers, assess the advantages and limitations of different synthesis methods for Nano composites and propose innovative approaches for improving their fabrication and performance.
CO3:	Discuss the principle, advantages and applications of organic electronic materials in electronic devices.
CO4:	Understand the statement of phase rule, industrial importance, types, composition and applications of alloys.
CO5:	Analyze isothermal transformation diagrams and cooling curves superimposed on them and application of heat treatment methods to enhance the surface properties of steel components for wear resistance and toughness.

Pre-requisite:

Basic knowledge on the concepts of engineering 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	3
CO5	3	3					2						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: CHEMISTRY OF POLYMERS AND COMPOSITES

9 Hours

Nomenclature and classifications of Polymers – Functionality – Types of Polymerization-addition-

condensation and copolymerization – Free Radical mechanism of addition polymerization – Properties of Polymers- Tg – tacticity - Moulding constituents of plastic – Moulding of plastics into articles-Injection-Compression and Blow moulding – Thermoplastic and Thermosetting Resins – Composites – Constituents – matrix and dispersed phase – various types of composites and their applications.				
Unit 02: NANOSTRUCTURED COMPOSITES				9 Hours
Definition of nanocomposites – Nanofillers: Classification, synthesis and properties– Synthesis of nanocomposites by physical methods - direct mixing and solution mixing - Chemical methods - Microemulsion synthesis, Microwave assisted synthesis and Sonochemical assisted synthesis-Types of nanocomposites - Core-Shell nanostructure, Organic-Inorganic hybrid nanocomposites, Quantum dot (QDs) synthesis.				
Unit 03: CHEMISTRY OF ORGANIC ELECTRONIC MATERIALS				9 Hours
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 in electronic industries.				
Unit 04: PHASE RULE AND ALLOYS				9 Hours
Statement and explanation of terms involved - limitations and applications of phase rule – Construction of phase diagram for one component system; water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems - Iron – Iron carbide equilibrium diagram, Classification of steel and cast-Iron, properties and application. Alloys: Introduction - Significance of alloying, Functions and effect of alloying elements - ferrous alloys – nichrome and stainless steel – non-ferrous alloys – brass and bronze- Introduction to Aluminium alloys – Titanium alloys, Mg-alloys, Ni-based super alloys.				
Unit 05: HEAT TREATMENT AND POWDER METALLURGY				9 Hours
Definition – Full annealing, stress relief, recrystallization, and spheroidising –normalizing, hardening and tempering of steel. Isothermal transformation diagrams – cooling curves superimposed on I.T. diagram – continuous cooling Transformation (CCT) diagram – austempering, martempering – hardenability, Jominy end quench test -case hardening, carburizing, Nitriding, cyaniding, carbonitriding – Flame and Induction hardening – vacuum and plasma hardening – thermo- mechanical treatments.				
Theory: 45 Hrs	Tutorial: 0	Practical: 0	Project:0	Total Hours: 45 Hrs
TEXT BOOKS				
1.	P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi , 17th Edition, 2018.			
2.	Kenneth G.Budinski and Michael K. Budinski, "Engineering Materials", Prentice Hall of India Private Limited, 9th edition, 2018.			
REFERENCES				

1.	H.K. Chopra, A. Parmer, "Chemistry for Engineers", Narosa Publishing House, New Delhi, 110002, 2016.
2.	Kannan P., Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2009
3.	B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 2008
4.	Ozin G. A. and Arsenault A. C., "Nanochemistry: A Chemical Approach to Nano materials", RSC Publishing, 2005.
5.	G.S. Upadhyay and Anish Upadhyay, "Materials Science and Engineering", Viva Books Pvt.Ltd, New Delhi, 2020.

M. Renuga
12/1/24

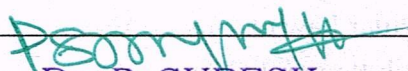
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C. Shanthi
12-1-2024

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U23MC201	ENGINEERING MECHANICS – STATICS AND DYNAMICS										L	T	P	J	C
											3	0	0	0	3
Course Outcomes															
After successful completion of this course, the students should be able to															
CO1:	Analyse the forces in statically determinate structures using scalar and vector analytical techniques.														
CO2:	Examine the condition for equilibrium of rigid body using free body diagram.														
CO3:	Evaluate the effect of friction of bodies under equilibrium condition.														
CO4:	Determine the centroid, moment of inertia and polar moment of inertia of simple and composite sections.														
CO5:	Analyse the motion of a body with force and without force causing the motion.														
Pre-requisite															
Physics for Engineers															
CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3	3	2		2	2			1		1	3	2	
CO2	3	3	3	2		2	2			1		2	3	2	
CO3	3	3	3	2		2	2			1		2	3	2	
CO4	3	3	3	2		2	2			1		1	3	2	
CO5	3	3	3	2		2	2			1		2	3	2	
Course Assessment methods															
Direct										Indirect					
CIE test I (8)					Objective 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: BASICS & STATICS OF PARTICLES													9 Hours		
Introduction – Units and Dimensions – Laws of Mechanics – Lame’s theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle - Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.															

Unit 02: EQUILIBRIUM OF RIGID BODIES IN 2 DIMENSIONS				9 Hours
Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point – Varignon’s theorem – Equilibrium of Rigid bodies in two dimensions.				
Unit 03: FRICTION				9 Hours
Frictional force – Laws of Coulomb friction – Angle of friction – cone of friction – Equilibrium of bodies on inclined plane- Ladder friction, Wedge friction, Screw friction.				
Unit 04: PROPERTIES OF SURFACES AND SOLIDS				9 Hours
Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, Hollow section by using standard formula. Second and product moments of plane area – Rectangle, triangle, circle from integration – T section, I section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia.				
Unit 05: DYNAMICS OF PARTICLES				9 Hours
Displacements, Velocity and acceleration, their relationship – Rectilinear and Curvilinear motion – Newton’s law – Work Energy Equation of particles – Impulse and Momentum– Impact of elastic bodies.				
Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs
TEXT BOOKS				
1. Beer, F.P and Johnson Jr. E.R. “Vector Mechanics for Engineers: Statics and Dynamics”, McGraw–Hill International 11 th Edition, 2016.				
2. Dr. N. Kottiswaran, “Engineering Mechanics (Statics and Dynamics)” ,Sri Balaji Publications 10th edition 2010.				
REFERENCES				
1. Rajasekaran, S, Sankarasubramanian, G., “Fundamentals of Engineering Mechanics”, Vikas Publishing House Pvt. Ltd., (2011).				
2. Hibbeler, R.C., “Engineering Mechanics”, Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2015).				
3. Palanichamy, M.S., Nagam, S., “Engineering Mechanics – Statics & Dynamics”, Tata McGraw–Hill, (2004).				
4. MeriamJ.L,KraigeL.G,“Engineering Mechanics-Statics”6th Edition, Wiley, 2017.				
5. Irving H. Shames, “Engineering Mechanics – Statics and Dynamics”, IV Edition– Pearson Education Asia Pvt. Ltd., (2006).				
6. Kumar, K.L., “Engineering Mechanics”, 3rd Revised Edition, Tata McGraw-Hill Publishing company, New Delhi (2008)				

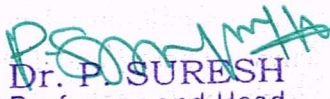


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U23MC202		BASIC ELECTRICAL ENGINEERING										L	T	P	J	C
												3	0	0	0	3
Course Outcomes																
After successful completion of this course, the students should be able to																
CO1:	Evaluate the behaviour of circuit elements in electric circuits.															
CO2:	Explain the principles of operation of magnetics circuits and transformers															
CO3:	Outline the construction and working principles of DC machines and synchronous machines.															
CO4:	Evaluate the electromagnetic energy conversion and operating principle of three phase induction motors.															
CO5:	Explain the principles of operations of single-phase induction and stepper motors.															
Pre-requisite																
Physics for Engineers																
CO/PO, PSO Mapping																
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO1	3	3	3	2			2			2			3	2		
CO2	3	3	3	2			2			2			3	2		
CO3	3	3	3	2			2			2			3	2		
CO4	3	3	3	2			2			2			3	2		
CO5	3	3	3	2			2			2			3	2		
Course Assessment methods																
Direct							Indirect									
CIE test I (8)					Objective 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: FUNDAMENTAL LAWS OF ELECTRICAL ENGINEERING AND CIRCUIT ELEMENTS												9 Hours				
Electric current – Coulomb’s law – Ohm’s law – Faraday’s law of electromagnetic induction – Kirchhoff’s laws – Energy and Power – Resistance parameter – Inductance parameter –Capacitance parameter – Series and parallel combinations of resistances –RLC series-parallel circuits – Series RLC resonance circuits																

Unit 02: MAGNETIC CIRCUITS AND TRANSFORMERS				9 Hours
Ampere's Law – Flux, Flux density, Field strength, Permeability, Reluctance, Permeance – Theory of magnetism – Hysteresis and Eddy-current losses - Magnetic Circuit - Self-inductance, Mutual inductance, Co-efficient of coupling - Transformers – Equivalent circuit – Parameters from No-Load tests – Efficiency and Voltage regulation.				
Unit 03: DC MACHINES AND THREE-PHASE SYNCHRONOUS MACHINES				9 Hours
DC Generator: construction, working principle, EMF equation, Types - DC motor: working principle, Types, Speed torque characteristics - starters for DC motors - Generation of a three-phase voltage- Synchronous generator - Construction and working principle.				
Unit 04: ELECTROMAGNETIC ENERGY CONVERSION AND THREE PHASE INDUCTION MOTOR				9 Hours
Introduction-Basic analysis of Electromagnetic torque – Three-phase induction motor – Revolving Magnetic Field – Construction- Working principle- Types - Speed-Torque characteristic – Parameters from no load and blocked rotor tests – Equivalent circuit – Applications of three-phase induction motors.				
Unit 05: SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES				9 Hours
Single Phase Induction Motor types: Split phase induction motor, Capacitor start induction motor, Capacitor start capacitor run induction motor - Switched reluctance motor- Working principle of stepper Motors: Variable reluctance stepper Motor and Hybrid stepper motor - PM Brushless DC motors - Applications				
Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs
Text Books				
1. B.L. Theraja and A. K. Theraja, "A Text Book of Electrical Technology", S.Chand Publication, Vol 2, 2014.				
2. A. Sudhakar and S.P Shyam Mohan, "Circuits, Network Analysis and Synthesis", Tata McGraw Hill, Fifth Edition, 2015.				
REFERENCES				
1. D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, Fourth Edition, 2011.				
2. V.K.Metha, Rohit Metha, "Principles of Electrical Engineering and Electronics", Second edition, S.Chand Publication, 2015.				
3. S.K.Bhattacharya "Basic Electrical and Electronics Engineering" Pearson Education India, 2012.				
4. V.N. Mittle and Aravind Mittal "Basic Electrical Engineering", Tata McGraw Hill, Second edition, 2005.				


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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 <u>நெசவு மற்றும் பாணைத் தொழில்நுட்பம்:</u> சங்க காலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் - கரும்பு சிவப்பு பாண்டங்கள் பாண்டங்களில் கீறல் குறியீடுகள்.						
Unit 02: DESIGN AND CONSTRUCTION TECHNOLOGY						3 Hours
அலகு II <u>வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்:</u> சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு- சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரம் 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 <u>உற்பத்தித் தொழில் நுட்பம்:</u> 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 <u>வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்:</u> அணை, ஏரி, குளங்கள், மதுகு - 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 <u>அறிவியல் தமிழ் மற்றும் கணித்தமிழ்:</u> அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.						

Theory: 15 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs
TEXT BOOKS				
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).			
2.	கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் 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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SALEM - 636 005.

U23TAM201	TAMILS AND TECHNOLOGY	L	T	P	J	C
		1	0	0	0	1
Course Outcomes						
At the end of the course, the student will be able to						
CO1:	Describe the weaving and ceramic technology					
CO2:	Explain the design and construction technology					
CO3:	Analyse the manufacturing technology					
CO4:	Describe the agriculture and irrigation technology					
CO5:	Explain the Scientific Tamil and Tamil Computing					
Course Assessment methods						
Direct				Indirect		
CIE test I (30)		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 Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society						
Unit 05: SCIENTIFIC TAMIL & TAMIL COMPUTING						3 Hours
Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries –Sorkuvai Project						
Theory: 15 Hrs		Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs	
TEXT BOOKS						
1.	தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).					
2.	கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்). கிழங்கு – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) பொருநரை – 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

Dr. M.RENUGA,
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Department of Humanities & Languages,
College of Technology,
LEM - 600 005.

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.				

S. Anita
6/02/2024

Dr.S.Anita
Professor & Head
Department of Training
Dr. S. ANITA
Professor and Head
Department of Training,
SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005.

U23WPL214		WORKSHOP PRACTICE (Common to MCT and FT 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:	Perform the various techniques of sheet metal fabrication.													
CO2:	Analyse various techniques of welding and carpentry works.													
CO3:	Solve the real-time problems using sheet metal, welding and carpentry.													
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	2
CO2	1							3					2	2
CO3	1							3					2	2
Course Assessment methods														
Direct								Indirect						
CIE test I (15) Quiz I- (5) CIE test II (15) Quiz II- (5)								RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination (40 marks)						
								Course end survey						

Importance of workshop practice- Introduction to Measuring and marking devices, Tools and equipment Maintenance - Workshop apparatus - Human safety practices - First aid procedures.

(Not for Examination)

LIST OF EXPERIMENTS

SECTION 1:	SHEET METAL	8 hours
	Making of Cone, Dust Pan and Funnel.	
SECTION 2:	WELDING	8 hours
	Arc welding of Butt joint and Lap Joint.	
SECTION 3:	CARPENTRY	8 hours
	Making of Half Lap joint and Dovetail Joint.	
Demonstration:	FOUNDRY PRACTICES	6 hours
	Simple pattern making	
		Total Number of hours: 30

Theory: --	Tutorial: --	Practical: 30 Hrs	Project: --	Total Hours: 30 Hrs
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Dr. D. SENTHIL KUMAR, M.E., Ph.D
 PROFESSOR & HEAD
 DEPT. OF MECHANICAL ENGG.
 SONA COLLEGE OF TECHNOLOGY
 JUNCTION MAIN ROAD, SALEM-5.

U23MC203	BASIC ELECTRICAL ENGINEERING AND DEVICES LABORATORY											L	T	P	J	C
												0	0	4	0	2
Course Outcomes																
After successful completion of this course, the students should be able to																
CO1:	Understand the usage of common electrical measuring instruments and basic characteristics of transformers and electrical machines.															
CO2:	Evaluate the characteristics of semiconductor devices.															
CO3:	Interpret the solutions for real time applications of electrical machines and semiconductor devices.															
Pre-requisite																
--																
CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 1	PSO 2		
CO1	3	3	3	3						2			3	2		
CO2	3	3	3	3						2			3	2		
CO3	3	3	3	3						2			3	2		
Course Assessment methods																
Direct										Indirect						
CIE TEST-I (15) Quiz-I (5) CIE TEST-II (15) Quiz-II (5)					RTPS (10) Record (10) Total CIE: 60 marks Semester End Examination (40) Marks					Course end survey						
List of Experiments																
1. Verification of Ohm's Law.																
2. Verification of Kirchoff's law.																
3. Measurement of power and power factor in series RLC circuit.																
4. Measurement of power and power factor in parallel RLC circuit.																
5. Measurement of transformer Efficiency and voltage regulation.																
6. Torque Speed Characteristic of DC series motor.																
7. Torque Speed Characteristic of DC shunt motor.																
8. Torque-slip characteristic of an induction motor.																
9. Verify the VI Characteristics of PN diode																
10. Verify the VI Characteristics of Zener diode																
11. Verify the VI Characteristics of SCR.																
12. Verify the VI Characteristics of MOSFET.																

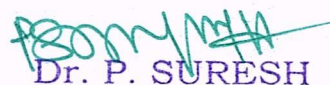
Total Hours: 60 Hrs

12.1.2024 Version I.0

Programme: B.E/B..Tech

Semester II

Regulations 2023


Dr. P. SURESH

Professor and Head

Department of Mechatronics Engineering

SONA COLLEGE OF TECHNOLOGY

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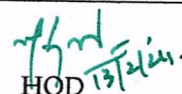
Ph:0427-4099999

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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 Salem

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			Course end survey			
CIE test II (30)			Semester End Examination: NIL						
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		
<ul style="list-style-type: none"> Food and beverages, Modal verbs, Separable verbs 									
Unit 04:							3 Hours		
<ul style="list-style-type: none"> Simple sentences using modal / separable verbs 									
Unit 05:							3 Hours		
<ul style="list-style-type: none"> 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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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		Course end survey				
CIE test II (30)			Semester End Examination: NIL						
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								


 13/2/24.
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