

SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.E- Biomedical Engineering

CURRICULUM and SYLLABI

[For students admitted in 2023-2024]

B.E / B.Tech Regulations 2023

Approved by BOS and Academic Council meetings

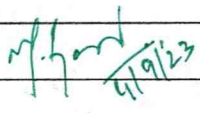
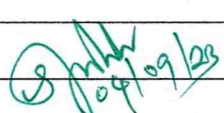
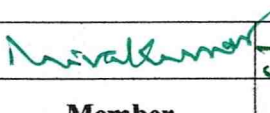
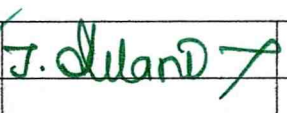
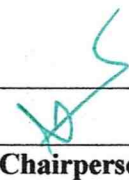
Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
Branch: Biomedical Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*	
Theory Courses											
1.	U23ENG101A	Communication Skills in English	2	0	2	0	3	HS	60	TL	
2.	U23MAT102B	Linear Algebra and Multivariable Calculus with MATLAB	3	0	2	0	4	BS	75	TL	
3.	U23BM101	Biochemistry	3	0	0	0	3	ES	45	T	
4.	U23BM102	Biosciences for Medical Engineering	3	0	0	0	3	ES	45	T	
5.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T	
6.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T	
7.	U23GE101	Basic Aptitude -I	2	0	0	0	0	AC	30	T	
Practical Courses											
8.	U23BML103	Biochemistry Laboratory	0	0	2	0	1	ES	30	L	
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L	
10.	U23WPL114	Workshop Practice	0	0	2	0	1	ES	30	L	
Total Credits							20				
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, BME BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.S.Prabakar	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/ Biomedical Engineering, First Semester B.E.BME Students and Staff, COE

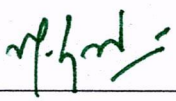
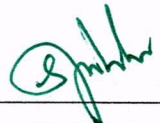


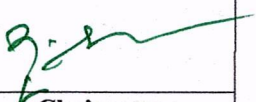
Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: Biomedical Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T
2.	U23MAT202B	Transforms and Differential Equations	3	1	0	0	4	BS	60	TT
3.	U23PHY203A	Physics for Biomedical Engineering	3	0	2	0	4	BS	75	TL
4.	U23EGR207	Engineering Graphics	3	0	0	0	3	ES	45	T
5.	U23BM201	Electrical Circuits and Machines for Medical Devices	3	0	0	0	3	ES	45	T
6.	U23BM202	Electronic Circuits for Medical Devices	3	0	0	0	3	ES	45	T
7.	U23TAM201	தமிழரும் தொழில் நுட்பமும் / Tamil and Technology	1	0	0	0	1	HS	15	T
8.	U23GE201	Basic Aptitude- II	2	0	0	0	0	AC	30	T
Practical courses										
9.	U23BM203	Electrical and Electronics for Medical Devices Laboratory	0	0	2	0	1	ES	30	L
Total Credits							21			
Optional Language Courses**										
10.	U23OL1201	French-II							15	T
11.	U23OL1202	German-II							15	T
12.	U23OL1203	Japanese-II	1	0	0	0	1	OL	15	T
13.	U23OL1204	Korean-II							15	T

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

Copy to:-

HOD/ Biomedical Engineering, Second Semester B.E. BME Students and Staff, COE **PRINCIPAL**
SONA COLLEGE OF TECHNOLOGY
SALEM - 636 005

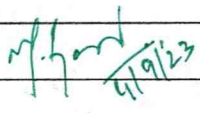
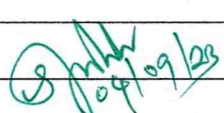
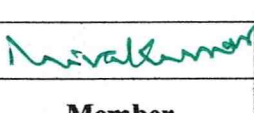
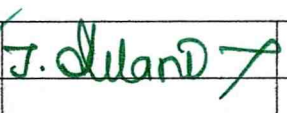
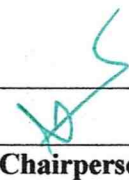
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Courses of Study for B.E/B.Tech. Semester I under Regulations 2023 (CBCS)
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S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*	
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2.	U23MAT102B	Linear Algebra and Multivariable Calculus with MATLAB	3	0	2	0	4	BS	75	TL	
3.	U23BM101	Biochemistry	3	0	0	0	3	ES	45	T	
4.	U23BM102	Biosciences for Medical Engineering	3	0	0	0	3	ES	45	T	
5.	U23PPR105	Problem Solving using Python Programming	3	0	0	0	3	ES	45	T	
6.	U23TAM101	தமிழர் மரபு / Heritage of Tamils	1	0	0	0	1	HS	15	T	
7.	U23GE101	Basic Aptitude -I	2	0	0	0	0	AC	30	T	
Practical Courses											
8.	U23BML103	Biochemistry Laboratory	0	0	2	0	1	ES	30	L	
9.	U23PPL112	Python Programming Laboratory	0	0	2	0	1	ES	30	L	
10.	U23WPL114	Workshop Practice	0	0	2	0	1	ES	30	L	
Total Credits							20				
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	

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Dr.M.Renuga	Dr.S.Prabakar	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

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HOD/ Biomedical Engineering, First Semester B.E.BME Students and Staff, COE

U23ENG101A	Communication Skills in English (Common to ADS, AIML, BME, CSD, CSE, CIVIL, ECE, EEE, MCT, FT, IT Branches)					L	T	P	J	C				
						2	0	2	0	3				
Course Outcomes														
At the end of the course, the student will be able to														
CO1:	Use grammatical components effectively in both written and spoken communication													
CO2:	Develop speaking skills for self-introduction, delivering speeches and technical presentation													
CO3:	Demonstrate effective listening skills for academic and professional purposes													
CO4:	Write emails and formal letters and build resumes and construct paragraphs													
CO5:	Develop speaking skills both in terms of fluency and comprehensibility													
Pre-requisite:														
<ul style="list-style-type: none"> • Knowledge and Understanding of Grammar • Fundamental Language Skills (LSRW) 														
CO/PO, PSO Mapping														
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	1	1	3	3	2	3	3	2	3	2	3
CO2	1	1	1	1	1	3	3	3	3	3	3	3	3	3
CO3	1	2	3	2	2	3	3	2	3	3	3	3	3	3
CO4	1	2	1	2	2	3	3	3	3	3	3	3	3	3
CO5	1	2	2	3	2	3	3	3	3	3	3	3	3	3
Course Assessment methods														
Direct						Indirect								
CIE test I (10) (Theory) CIE test II (10) (Theory) CIE test III (10) (Theory) CIE test IV (10) (Practical) Assignment/seminar/Quiz (5)						Attendance (5) Total CIE: 50 marks Semester End Examination (50) (SEE – Theory (25 marks + Lab (25 marks)					Course end survey			
Unit 01:											6 Hours			
<ul style="list-style-type: none"> • General vocabulary, Parts of Speech, Articles • Email, fixing an appointment, cancelling appointments, conference details, hotel accommodation, order for equipment, training programme details, paper submission for seminars and conferences • Paragraph writing – Describing – defining – providing examples or evidences 														

Unit 02:				6 Hours	
<ul style="list-style-type: none"> • Tenses, Sentence Patterns • Instructions • Letter Writing - calling for quotations, placing orders 					
Unit 03:				6 Hours	
<ul style="list-style-type: none"> • Prefixes and Suffixes • Cover letter and resume writing 					
Unit 04:				6 Hours	
<ul style="list-style-type: none"> • Modal verbs, concord • Checklist • Letter Writing - Business communication, complaints, replies to queries from business customers 					
Unit 05:				6 Hours	
<ul style="list-style-type: none"> • If conditionals • Letter Writing - inviting dignitaries, accepting and declining invitations 					
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.				


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

B. E. / BIOMEDICAL ENGINEERING															
SEMESTER - I	LINEAR ALGEBRA AND MULTIVARIABLE CALCULUS WITH MATLAB										L	T	P	J	C
U23MAT102B											3	0	2	0	4
Course Outcomes															
At the end of the course, the student will be able to															
CO1:	apply the concepts of vector spaces and linear transformations in real world applications														
CO2:	apply the concepts of eigenvalues and eigenvectors of a real matrix and their properties to diagonalize the matrix.														
CO3:	find the Taylor's series expansion, Jacobians and the maxima and minima of functions of two variables														
CO4:	apply appropriate techniques of multiple integrals to find the area and volume														
CO5:	apply the concepts of vector differentiation and integration to find the area and volume.														
Pre-requisites:															
<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		
CO2	3	3		3								2	3		
CO3	3	3		3								2	3		
CO4	3	3		3								2	3		
CO5	3	3		3								2	3		
Course assessment methods [Theory with laboratory course]															
Direct							Indirect								
CIE test I (10) (Theory) CIE test II (10) (Theory) CIE test III (10) (Theory) CIE test IV (10) (Practical) Attendance (5) Assignment/Quiz/Seminar (5)							Total CIE: 50 marks Semester End Examination (50) [SEE- Theory (35) + Lab(15) marks]					Course end survey			
Unit 01	VECTOR SPACES											9 Hours			
Vector space – linear independence and dependence of vectors – basis – dimension – linear transformations (maps) – matrix associated with a linear map – range and kernel of a linear map.															
Unit 02	EIGENVALUES AND EIGENVECTORS											9 Hours			
Eigenvalues and eigenvectors of real matrices – properties of eigenvalues and eigenvectors – Cayley-Hamilton theorem – diagonalization of real symmetric matrices.															
Unit 03	FUNCTIONS OF SEVERAL VARIABLES											9 Hours			
Functions of several variables – partial differentiation – total derivative – Jacobians – Taylor's theorem for functions of two variables – maxima and minima of functions of two variables without constraints – constrained maxima and minima by Lagrange's method of undetermined multipliers.															

Unit 04	MULTIPLE INTEGRALS				9 Hours
Double integrals – change of order of integration – change of variables from Cartesian to polar coordinates – area as double integrals in Cartesian coordinates – triple integrals – volume as triple integrals in Cartesian coordinates.					
Unit 05	VECTOR CALCULUS				9 Hours
Vector differentiation: Scalar and vector valued functions – gradient, directional derivative, divergence and curl – scalar potential.					
Vector integration: Line, surface and volume integrals – statement of Green's, Stoke's and Gauss divergence theorems – simple applications involving squares, rectangles, cubes and rectangular parallelopiped.					
List of MATLAB Programs					
1.	Programs based on elementary operations on matrices				
2.	Computing the rank of a matrix				
3.	Finding eigenvalues and eigenvectors of a matrix				
4.	Finding partial derivatives of functions of several variables				
5.	Computing stationary points of functions of two variables				
6.	Taylors series expansion of functions of two variables				
7.	Evaluating double integrals				
8.	Finding area as double integrals				
9.	Evaluating triple integrals				
10.	Finding volume as triple integrals				
Theory: 45 Hrs		Tutorial: -	Practical: 30 Hrs	Project:--	Total Hours: 75 Hrs
TEXT BOOKS:					
1.	T. Veerarajan, "Linear Algebra and Partial Differential Equations", McGraw Hill Publishers, 1 st Edition, 2018.				
2.	T. Veerarajan, "Engineering Mathematics for Semesters I & II", McGraw Hill Publishers, 1 st Edition, 2019.				
3.	W. Yang, Y. K. Choi, K. Jaekwon, M. C. Kim, H. J. Kim and T. Im, "Engineering Mathematics with MATLAB", CRC Press Publishers, 1 st Edition, 2017.				
REFERENCE BOOKS:					
1.	S. Lipschutz and M. L. Lipson, "Linear Algebra", McGraw Hill Publishers, 6 th Edition, 2018.				
2.	E. Kreyszig, "Advanced Engineering Mathematics", Wiley Publishers, 10 th Edition, Reprint, 2017.				
3.	C. Prasad and R. Garg, "Advanced Engineering Mathematics", Khanna Publishers, 1 st Edition, 2018.				
4.	B. V. Ramana, "Higher Engineering Mathematics", McGraw Hill Publishers, 29 th Reprint, 2017.				
5.	B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44 th Edition, 2018.				
6.	D. Xu, "Calculus problem solutions with MATLAB", Walter de Gruyter Publishers, 1 st Edition, 2020.				

S. Jayabharathi

Dr. S. JAYABHARATHI
 Head / Department of Mathematics
 Sona College of Technology
 Salem – 636 005

M. Renuga

Dr. M. RENUGA
 BoS - Chairperson
 Science and Humanities
 Sona College of Technology
 Salem – 636 005

Dr. M. RENUGA,
 Professor & Head,

BoS Date: 08. 07. 2023

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

Department of Humanities & Languages,
B.E / B.Tech Regulations 2023,
 Sona College of Technology,
 SALEM - 636 005

U23BM101		BIOCHEMISTRY											L	T	P	J	C
													3	0	0	0	3
COURSE OUTCOMES																	
On successful completion of this course, the student will be able to																	
CO1	•	Outline the fundamentals of Biochemistry.															
CO2	•	Illustrate the Qualitative analysis of Enzymes and Biomolecules.															
CO3	•	Explain the various disorders of metabolism in the human body.															
CO4	•	Summarize the working principle of Centrifuge and its applications															
CO5	•	Classify the various techniques involved in biochemical analysis.															
CO/PO, PSO Mapping																	
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																	
Programme Outcomes (PO's) and Programme Specific Outcomes (PSO's)																	
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
CO1	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO2	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO3	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO4	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO5	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
UNIT I FUNDAMENTALS TO BIOCHEMISTRY															9		
Introduction to Biochemistry, water as a biological solvent, weak acid and bases, pH, buffers, Handerson - Hasselbalch equation, Buffer system of Human Body. Properties of water and their applications in biological systems.																	
UNIT II MOLECULAR ANALYSIS AND ENZYMES															9		
Introduction to Carbohydrates-Amino Acids and Proteins- Nucleic Acids and Lipids-Nature of Bonding and Qualitative Tests-Classification and Nomenclature of Enzymes-Co-Factors-Importance of Enzymes.																	
UNIT III DISORDERS OF METABOLISM															9		
Disorders of Carbohydrate Metabolism: Diabetes Mellitus, Hypoglycemia and Glycogen Storage diseases. Disorders of Lipid Metabolism: Hyperlipidemia, Hyperlipoproteinemia and Hypercholesterolemia. Disorders of amino acid Metabolism: alkaptonuria, Phenylketonuria and aminoaciduria.																	

UNIT IV	CENTRIFUGATION AND ITS APPLICATIONS	9
Basic principles of sedimentation, Svedberg's constant, sedimentation velocity and sedimentation equilibrium. Types of centrifuges – desktop, high speed and ultracentrifuges. Types of Rotors - swinging bucket, fixed angle, vertical tube and zonal rotor. Types of centrifugation: Preparative centrifugation - differential and density gradient centrifugation with applications, Analytical centrifugation – molecular weight determination.		
UNIT V	BIOCHEMICAL ANALYZERS	9
Chromatographic Techniques: Principles, procedure and applications of paper chromatography, thin layer chromatography. Electrophoretic Techniques: Principles, techniques and applications of gel electrophoresis - agarose, SDS- PAGE. Spectroscopic Techniques: Principles, instrumentations and applications of colorimeter, spectrophotometer.		
TOTAL : 45 Hours		
TEXTBOOKS:		
1.	Keith Wilson & John Walker, "Practical Biochemistry - Principles & Techniques", Oxford University Press, 2009.	
2.	Avinash Upadhyaye and Nirmalendhe Nath, "Biophysical Chemistry-Principles and Techniques" Himalaya Publishing House, 2009	
REFERENCES:		
1.	Keith Wilson and Kenneth Goulding, "A Biologist Guide to Principles and Techniques of Biochemistry" Edward Arnold publishers, 1986..	
2.	Rafi M D "Text book of biochemistry for Medical Student" Fourth Edition, Universities Press, Orient Blackswan Private Limited - New Delhi 2021.	


ACADEMIC COORDINATOR

K.Manikandan
Asst Prof /BME


BOS-CHAIRMAN
BME

Dr.S.PRABAKAR, M.E.,Ph.D.,
Professor and Head
Department of Biomedical Engineering
Sona College of Technology, Salem-5

U23BM102		BIOSCIENCES FOR MEDICAL ENGINEERING											L	T	P	J	C
													3	0	0	0	3
COURSE OUTCOMES																	
On successful completion of this course, the student will be able to																	
CO1	•	Analyze the cell growth and structure															
CO2	•	Know about various types of metabolism in living organisms.															
CO3	•	Understand the thermal and energy properties of the human body															
CO4	•	Explain the various electrical and magnetic properties of the body tissue															
CO5	•	Describe about characteristic flow dynamics involved in the body fluids.															
CO/PO, PSO Mapping																	
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																	
CO's	Programme Outcomes (PO's) and Programme Specific Outcomes (PSO's)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
CO1	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-		
CO2	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-		
CO3	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-		
CO4	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-		
CO5	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-		
UNIT I	THE BASIC UNIT OF LIFE														9		
Cell- Basic Properties of Cells- Prokaryotic Cells- Eukaryotic Cells- Cell Cycle and Cell Division- M Phase- Meiosis- Cell Differentiation.																	
UNIT II	METABOLISM														9		
Metabolism and Its Concepts- Metabolic Basis for Living – Types: Anabolic and Catabolic Pathways. Cellular Respiration- Types: Aerobic and Anaerobic Respiration- Phases of Respiration in Organisms: Glycolysis, Oxidative Phosphorylation and TCA Cycle.																	
UNIT III	THERMAL & ENERGY PROPERTIES OF THE BODY														9		
Conservation of Energy and Heat Flow- Energy Content of Body Fuel- Energy Storage- Energy Storage Molecules- Metabolic Rates- Basal Metabolic Rate- Mechanical Work and Power- Loss of Body Heat- Introduction to Modes of Heat Loss.																	

UNIT IV	ELECTRICAL AND MAGNETIC PROPERTIES OF THE BODY	9
Review of Electrical Properties- Electrical Properties of Body Tissues- Electrical Conduction, Through Blood and Tissues- Ion Channels, Hair Cells, Balance, Taste, and Smell- Magnetic Properties- Magnetic Field from an Axon- Magnetic Sense.		
UNIT V	PROPERTIES OF BODY FLUIDS	9
Characteristic Pressures in the Body- Definition and Units- Measuring Pressure- Basic Physics of, Pressure and Flow of Fluids- Fluids in Motion- Equation of continuity -Bernoulli's Equation- Resistance in Flow: Viscous Flow and Poiseuille's Law-Compliance in Flow-Flow under Special Conditions-Diffusion-Pressure and Flow in the Body-Motion of Humans in Fluids		
TOTAL : 45 Hours		
TEXTBOOKS:		
1.	Rafi MD "Text book of biochemistry for Medical Student" Fourth Edition, Universities Press, Orient Blackswan Private Limited - New Delhi 2021.	
2.	Murray. R.K., et al "Harper's Illustrated Biochemistry", 27th Edition, McGraw-Hill, 2006.	
3.	Irving P. Herman "Physics of the Human Body" Second Edition, Springer 2015.	
REFERENCES:		
1.	Satyanarayana, U. and U. Chakerapani, "Biochemistry" 3rd Rev. Edition, Books & Allied (P) Ltd., 2006	
2.	Krishna B. Chandran, Ajit P. Yoganathan and Stanley E. Rittgers, Biofluid Mechanics: The Human Circulation, Taylor and Francis, 2007.	

ACADEMIC COORDINATOR

K.Manikandan
Asst Prof /BME

BOS-CHAIRMAN
BME

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Professor and Head
Department of Biomedical Engineering
Sona College of Technology, Salem-5

U23BML103		BIOCHEMISTRY LABORATORY											L	T	P	J	C
													0	0	2	0	1
COURSE OUTCOMES																	
On successful completion of this course, the student will be able to																	
CO1	•	Understand the Biochemistry laboratory functional components.															
CO2	•	Illustrate the Qualitative analysis of Biomolecules.															
CO3	•	Perform various techniques involved in biochemical analysis.															
CO/PO, PSO Mapping																	
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																	
Programme Outcomes (PO's) and Programme Specific Outcomes (PSO's)																	
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
CO1	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO2	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
CO3	2	-	-	1	-	-	-	-	-	-	-	-	1	-	-		
LIST OF EXPERIMENTS:																	
1	Preparation of solutions: 1) Percentage solutions, 2) Molar solutions, 3) Normal solutions.																
2	Qualitative Analysis of Carbohydrates- Benedict's Test and Fehling's Test.																
3	Qualitative Analysis of Proteins - Ninhydrin test and Biuret Test.																
4	Qualitative Analysis of Lipids - Solubility Test and Saponification test.																
5	Qualitative Analysis of Amino Acids - Xanthoproteic Test and Millon's Test.																
6	Measurement of pH of solutions using pH meter.																
7	Determination of percentage Transmittance, Absorbance, and concentration of given Solution using a spectrophotometer.																
8	Biochemical Analysis using Paper Chromatography.																
9	Determine the concentration of a colored compound using a Colorimeter.																
10	Separation of proteins by SDS electrophoresis.																
TOTAL: 30 PERIODS																	

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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					

U23WPL114	WORKSHOP PRACTICE					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	P09	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 Making of Cone, Dust Pan and Funnel.	8 hours
SECTION 2:	WELDING Arc welding of Butt joint and Lap Joint.	8 hours
SECTION 3:	CARPENTRY Making of Half Lap joint and Dovetail Joint.	8 hours
Demonstration:	FOUNDRY PRACTICES Simple pattern making	6 hours
		Total Number of hours: 30

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


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


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 Department of Humanities & Language

U23OL1104		Korean			L	T	P	J	C
					1	0	0	0	1
Course Outcomes									
At the end of the course, the student will be able to									
CO1:	Use single vowels and consonants syllable structure.								
CO2:	Greet others and introduce themselves.								
CO3:	Identify time , date and week								
CO4:	Explain location and places								
CO5:	Construct simple sentences / questions.								
Course Assessment methods									
Direct					Indirect				
CIE test I (30)			Total CIE: 100 marks		Course end survey				
CIE test II (30)			Semester End Examination: NIL						
CIE test III (40)									
Unit 01: Hangeul							3 Hours		
Single Vowels & Consonants Syllable Structure Tense Consonants Aspirated Consonants Double Vowels Final Consonants Double Final Consonants Liaison									
Unit 02: Introduction							3 Hours		
Greetings Talking about names Self-introduction Introducing my family members									
Unit 03: Time and Date							3 Hours		
Talking about location Talking about dates and days of the week Talking about doing something in the past									
Unit 04: Location and Places							3 Hours		
Talking about location Talking about doing something at a location Talking about directions									
Unit 05: Future							3 Hours		
Talking about doing something in the future Talking about plans for the future Talking about hope for the future									
Theory: 15 Hrs		Tutorial: --		Practical: --		Project:--		Total Hours: 15 Hrs	
REFERENCES									
1	Vitamin Korean - 1								


HOD
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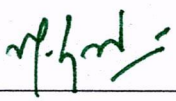
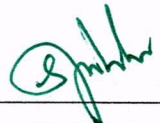


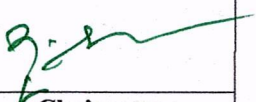
Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester II under Regulations 2023 (CBCS)
Branch: Biomedical Engineering

S.No	Course Code	Course Title	L	T	P	J	C	Category	Total Contact Hours	Course Type*
Theory courses										
1.	U23ENG201A	Technical English	2	0	0	0	2	HS	30	T
2.	U23MAT202B	Transforms and Differential Equations	3	1	0	0	4	BS	60	TT
3.	U23PHY203A	Physics for Biomedical Engineering	3	0	2	0	4	BS	75	TL
4.	U23EGR207	Engineering Graphics	3	0	0	0	3	ES	45	T
5.	U23BM201	Electrical Circuits and Machines for Medical Devices	3	0	0	0	3	ES	45	T
6.	U23BM202	Electronic Circuits for Medical Devices	3	0	0	0	3	ES	45	T
7.	U23TAM201	தமிழரும் தொழில் நுட்பமும் / 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.	U23BM203	Electrical and Electronics for Medical Devices Laboratory	0	0	2	0	1	ES	30	L
Total Credits							21			
Optional Language Courses**										
10.	U23OL1201	French-II							15	T
11.	U23OL1202	German-II							15	T
12.	U23OL1203	Japanese-II	1	0	0	0	1	OL	15	T
13.	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, BME BoS	Member Secretary, Academic Council	Dean-Academics	Chairperson, Academic Council & Principal
Dr.M.Renuga	Dr.S.Prabakar	Dr.R.Shivakumar	Dr.J.Akilandeswari	Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/ Biomedical Engineering, Second Semester B.E. BME 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

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M - 62

SEMESTER - II	TRANSFORMS AND DIFFERENTIAL EQUATIONS										L	T	P	J	C								
U23MAT202B	Common to BIOMEDICAL, ELECTRONICS AND COMMUNICATION & ELECTRICAL AND ELECTRONICS ENGINEERING										3	1	0	0	4								
Course Outcomes																							
At the end of the course, the student will be able to																							
CO1:	apply the classical methods to solve linear ordinary differential equations with constant coefficients.																						
CO2:	apply the Laplace transforms technique and its properties to solve ordinary differential equations.																						
CO3:	express a periodic signal as an infinite sum of sine and cosine wave components using Fourier series.																						
CO4:	apply the Fourier transform techniques to convert the signal in terms of the frequencies of the waves.																						
CO5:	find the general and singular solutions of linear and nonlinear partial differential equations.																						
Pre-requisites:																							
<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	3		3								2	3										
CO2	3	3		3								2	3										
CO3	3	3		3								2	3										
CO4	3	3		3								2	3										
CO5	3	3		3								2	3										
Course assessment methods [Theory with tutorial course]																							
Direct								Indirect															
CIE test I (8) (Theory) CIE test II (8) (Theory) CIE test III (8) (Theory) Objectives Test (6)								Attendance (5) Assignment/Quiz/Seminar (5) Total CIE: 40 marks Semester End Examination: 60marks								Course end survey							
Unit 01	ORDINARY DIFFERENTIAL EQUATIONS												12 Hours										
Higher order linear ordinary differential equations with constant coefficients – Cauchy's and Legendre's linear ordinary differential equations – Method of variation of parameters.																							
Unit 02	LAPLACE TRANSFORMS												12 Hours										
Laplace transform: Conditions for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse function – Initial and final value theorems – Transform of periodic functions.																							

Inverse Laplace transform: Standard results – Statement of convolution theorem and its applications – Solution of second order linear ordinary differential equations with constant coefficients using Laplace transform.				
Unit 03	FOURIER SERIES			12 Hours
General Fourier series – Dirichlet’s conditions – Change of intervals – Odd and even functions – Half range sine and cosine series – Root mean square – Parseval’s identity – Harmonic analysis.				
Unit 04	FOURIER TRANSFORMS			12 Hours
Statement of Fourier integral theorem – Infinite Complex Fourier transform pair and their Properties – Infinite Fourier sine and cosine transforms pair and their properties – Transforms of simple functions – Parseval’s identity.				
Unit 05	PARTIAL DIFFERENTIAL EQUATIONS			12 Hours
Formation of partial differential equations – Lagrange’s partial differential equation – Clairaut’s form of partial differential equations – Second order linear partial differential equation with constant coefficients.				
Theory: 45 Hrs		Tutorial: - 15	Practical: -	Project:--
Total Hours: 60 Hrs				
TEXT BOOKS:				
1.	T. Veerarajan, “Transforms and Partial Differential Equations”, McGraw Hill Publishers, 3 rd Edition, 2016.			
2.	T. Veerarajan, “Engineering Mathematics for Semesters I & II”, McGraw Hill Publishers, 1 st Edition, 2019.			
REFERENCE BOOKS:				
1.	E. Kreyszig, “Advanced Engineering Mathematics”, Wiley Publishers, 10 th Edition, Reprint, 2017.			
2.	C. Prasad and R. Garg, “Advanced Engineering Mathematics”, Khanna Publishers, 1 st Edition, 2018.			
3.	B. S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers, 44 th Edition, 2018.			
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BoS Date: 08. 07. 2023			HoD / Mathematics	

U23PHY203A		PHYSICS FOR BIOMEDICAL ENGINEERING										L	T	P	J	C
												3	0	2	0	4
Course Outcomes																
At the end of the course, the student will be able to																
CO1:	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:	Explain the ultrasonic inspection technique in the field of medicine.															
CO5:	Elucidate the applications of X rays and radioactivity in the field of medicine.															
Pre-requisite:																
Basic knowledge in atomic physics, optics and modern physics.																
CO/PO, PSO Mapping																
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak																
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO1	3	2	-	-	-	2	2	-	-	2	-	1	-	2		
CO2	3	2	-	-	-	2	2	-	-	2	-	1	-	2		
CO3	3	2	-	-	-	2	2	-	-	2	-	1	-	2		
CO4	3	2	-	-	-	2	2	-	-	2	-	1	-	2		
CO5	3	2	-	-	-	2	2	-	-	2	-	1	-	2		
Course Assessment methods																
Direct										Indirect						
CIE test I (10) - Theory CIE test II (10) - Theory CIE test III (10) - Theory CIE test IV(10) - Laboratory					Attendance (5) Assignment / Quiz/ Seminar (5) Total CIE: 50 marks Semester End Examination: 50 marks [SEE- Theory (35 marks), Lab (15 marks)]					Course end survey						
Unit 01: 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: ULTRASONICS				9 Hours
Introduction - Ultrasonic waves - Properties of ultrasonic waves - Production of ultrasonic waves by magnetostriction and piezoelectric methods - Ultrasonic imaging systems – Block diagram of ultrasonic imaging system - A scan, B scan and T-M mode display - Ultrasound pictures of human body - Ultrasonic technique to measure blood flow and heart beat - Physiological effects of ultrasound therapy - Phonocardiography.				
Unit 05: MEDICAL PHYSICS				9 Hours
Electromagnetic spectrum - Introduction to X- rays – Production of X - ray images – Producing live X - ray images – Radiation given to patients – Nuclear medicine – Sources of radioactivity – Radioisotopes for nuclear medicine – Statistical aspects of radioactivity decay in radioisotopes – Nuclear imaging techniques – Basic instrumentation for nuclear imaging – Gamma ray camera – Positron emission tomography.				
Theory: 45 Hrs	Tutorial: --	Practical: 30 Hrs	Project:--	Total Hours: 75 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 2019.			
2.	M. Arumugam, "Applied Physics" Anuradha agencies, Kumbakonam 2001.			
3.	R.Wolfson, "Essential University Physics", Volume 1 & 2. Pearson Education (Indian Edition), 2009.			
4.	J. R. Cameron, J. G. Skofronick, Medical Physics, John Wiley and Sons.			
5.	William D. Callister Jr., David G. Rethwisch, "Callister's Materials Science and Engineering", 10th			

Edition, Global Edition 2019.

LIST OF EXPERIMENTS		30 Hours
1.	Determination of the thickness of a thin wire by forming interference fringes using air wedge apparatus.	
2.	Determination of velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer.	
3.	Determination of specific resistance of a given wire using Carey Foster's bridge.	
4.	Determination of the wavelength of a diode laser.	
5.	Determination of particle size of lycopodium powder using diode laser.	
6.	Determination of acceptance angle and numerical aperture of an optical fibre using diode laser.	
7.	Determination of Wavelength of Mercury spectrum using spectrometer.	
8.	Determination of coefficient of viscosity of liquid by Poiseuille's method.	

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12.1.2024

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M. Renuga
12/1/24

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U23EGR207	ENGINEERING GRAPHICS (Common to ADS, IT, BME, CSE, ECE, and FT branches)					L	T	P	J	C				
						3	0	0	0	3				
Course Outcomes														
At the end of the course, the student will be able to														
CO1:	Construct –Ellipse, Parabola, Hyperbola, Cycloids and Involutes.													
CO2:	Draw the projection of Point, Line and Plane surfaces.													
CO3:	Draw the projection of simple solids by rotating object method.													
CO4:	Develop the section of simple solids and lateral surface of truncated solids.													
CO5:	Draw the isometric view to orthographic projection.													
Pre-requisite: Nil														
CO/PO, PSO Mapping (3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1						3		2				1	
CO2					3			2		2		2		2
CO3					3			2		2		2	1	2
CO4					3			2		2		2	1	2
CO5			2					2		2		2	1	
Course Assessment methods														
Direct						Indirect								
CIE test I (8) CIE test II (8) CIE test III (8) Assignment/seminar/Quiz (5)						Objectives Test (6) Attendance (5) Total CIE: 40 marks Semester End Examination (60)					Course end survey			
CONCEPTS AND CONVENTIONS - (Not for Examination). 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
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Unit 03: PROJECTION OF SOLIDS (CAD Software) Projection of simple solids - prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.	9 Hours
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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
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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
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Theory: 45 Hrs	Tutorial: --	Practical: --	Project: --	Total Hours: 45 Hrs
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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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U23BM201	ELECTRICAL CIRCUITS AND MACHINES FOR MEDICAL DEVICES					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 electrical quantities and components.														
CO2:	Analyze the network topologies of the circuit.														
CO3:	Analyze the performance of the basic laws to calculate the voltage, current and power for circuits.														
CO4:	Explain the construction details and working principles of electrical machines.														
CO5:	Elucidate the principle and working of the Special Machines used in Biomedical applications.														
Pre-requisite:															

CO/PO, PSO Mapping															
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	1	1	1	2	1	-
CO2	3	3	2	-	-	-	-	-	-	1	1	1	2	1	-
CO3	3	3	2	2	-	-	-	-	-	1	1	1	2	1	-
CO4	3	2	2	2	-	-	-	-	-	1	1	1	2	1	-
CO5	3	2	2	-	2	-	-	-	-	1	1	1	2	1	-
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: BASICS OF ELECTRICAL PERCEPTIONS											9 Hours				
Definition of Electric Voltage, Current, Power, Power factor and energy, Ohms law, Kirchhoff's Laws and its applications-Frequency analysis: AC and DC Signals-Types of sources: single phase-three phase. Resistance-Inductance-capacitance-Series and parallel combinations.															
Unit 02: CIRCUIT ANALYSIS											9 Hours				
Review on mesh and nodal analysis – Star Delta Transformation Techniques – Phase Relationship For R, L and C – Impedance, Admittance for R, and C Elements – Concept of Duality – Dual Network – Graphs of A Network – Trees, Twig, Link and Branches. Case Study – Measurement of skin temperature using Thermistor.															
Unit 03: CIRCUIT THEOREMS-DC ANALYSIS											9 Hours				
Superposition Theorem – Thevenin's Theorem – Norton's Theorem – Reciprocity Theorem – Maximum Power Transfer Theorem – Tellegen's Theorem – Millman's Theorem. Case Study – Bio signal Analysis.															

Unit 04: ELECTRICAL MACHINES				9 Hours
DC Generator: construction of DC Machine – working principle of DC Generator – EMF equation – Types of DC Generator. DC Motor: Working principle of DC Motor – Types of DC Motor. Step-down and Step-up Transformers: Working principle of Transformer – EMF equation – Transformation ratio. Case Study – Motorized Wheelchair.				
Unit 05: SPECIAL MACHINES				9 Hours
Construction-Working principle -Stepper Motor, Servo Motor, Permanent Magnet Brushless D.C. Motors and drives. Case Study – Myoelectric prosthesis.				
Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs
TEXT BOOKS				
1.	D P Kothari and I J Nagrath, "Basic Electrical and Electronics Engineering", Mc Graw Hills (India) Private Limited, Second Edition 2020.			
2.	A Sudhkar, Shammohan Palli," Circuit and Network Analysis and Synthesis", Mc-Graw Hill,2019.			
REFERENCES				
1.	D. Devaraj, S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson India, 2016.			
2.	Abhi Chakrabarti, Sudipta Debnath, Soumitra Kumar Mandal, "Basic Electrical & Electronics Book ",Mc Graw Hill Education; Fifth Edition, 2016.			
3.	Ravi R Singh , "Networks Analysis and Synthesis", Mc-Graw Hill Education ,2019.			
4.	M.L.Soni and J.C.Guptha Acourse in " Electrical Circuit Analysis",Dhanpat Rai & Co ,2015.			

ACADEMIC COORDINATOR

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AP/BME

BOS-CHAIRMAN

HOD-BME

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Sona College of Technology, Salem-5

U23BM202	ELECTRONIC CIRCUITS FOR MEDICAL DEVICES					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 concept of transistor bias and stability factor.														
CO2:	Analyze the characteristics of different electronic devices such as diode and transistors														
CO3:	Explain the structure and working operation of FETs.														
CO4:	Employ the acquired knowledge in the design and analysis of rectifiers and power supply.														
CO5:	Analyze the characteristics of Special Devices in Biomedical Applications.														
Pre-requisite:															

CO/PO, PSO Mapping															
(3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	1	-	-	-	1	-	1	3	2	-
CO2	3	2	1	-	-	1	-	-	-	1	-	1	3	2	-
CO3	3	2	1	-	-	1	-	-	-	1	-	1	3	2	-
CO4	3	2	1	-	-	1	-	-	-	1	-	1	3	2	-
CO5	3	2	1	-	2	1	-	-	-	1	-	1	3	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: SEMICONDUCTOR DIODES											9 Hours				
Energy band theory-Conductor-Insulator-Semiconductor-Doping-formation of N-type and P-type materials-PN junction Diode – V-I Characteristics- Zener diode- VI characteristics of Zener-Avalanche break down. - Zener effect-Zener diode as voltage regulator.															
Unit 02: SEMICONDUCTOR TRANSISTORS											9 Hours				
Bipolar Junction Transistor – construction-Working principle-Regions of transistor-CB, CE, CC Configurations and Characteristics –Transistor as a switch – Applications of transistor –JFETs – Drain and Transfer characteristics - Pinch off voltage and its significance- MOSFET- Characteristics- Threshold voltage -Channel length modulation .Case Study - Differential Amplifier using BJT.															
Unit 03: TRANSISTOR BIAS STABILITY											9 Hours				
BJT-Need for biasing-Stability factor-Fixed bias circuit. Load line and quiescent point. Variation of quiescent point due to hFE variation within manufacturers tolerance-Stability factors-Different types of															

biasing circuits-Method of stability the Q point-Advantage of self bias (Voltage divider bias) over other types of bias as a constant current circuit.				
Unit 04: RECTIFIERS AND POWER SUPPLIES				9 Hours
Classification of power supplies, Rectifiers - Half-wave, full-wave and bridge rectifiers with resistive load. Analysis for V dc and ripple voltage with C, L, LC and CLC filters. Case Study – Sphygmomanometer charger circuit.				
Unit 05: SPECIAL DEVICES				9 Hours
Construction and Characteristics of - Tunnel Diode-Varactor diode-Photo diode- Photo transistor- SCR-TRIAC-DIAC. Case Study – Pulse oximeter.				
Theory: 45 Hrs	Tutorial: --	Practical: --	Project:--	Total Hours: 45 Hrs
TEXT BOOKS				
1.	D P Kothari and I J Nagrath, "Basic Electrical and Electronics Engineering", Mc Graw Hills (India) Private Limited, 2020.			
2.	Millman and Halkias, "Integrated Electronics", 2nd Edition, Tata Mc Graw Hill, 2017.			
3.	Anil K. Maini and Varsha Agrawal, "Electronics Devices and Circuits", First Edition, Wiley Publications, 2009.			
REFERENCES				
1.	D. Devaraj, S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson India, 2017.			
2.	Abhi Chakrabarti, Sudipta Debnath, Soumitra Kumar Mandal, "Basic Electrical & Electronics Book ", Mc Graw Hill Education; Fifth Edition, 2016.			
3.	Ravish Singh, "Basic Electrical & Electronics Engineering", McGraw Hill Education, 2014.			
4.	Y.N. Bapat, "Electronic devices and circuits, Discrete and Integrated", 3rd Edition, Tata Mc Graw Hill, 2011.			


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Prof.K.Manikandan

AP/BME


BOS-CHAIRMAN

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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 - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.						
Unit 03: MANUFACTURING TECHNOLOGY						3 Hours
அலகு III <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 குழுழித் 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.	கணிணித் 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

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

U23TAM201	TAMILS AND TECHNOLOGY	L	T	P	J	C
		1	0	0	0	1
Course Outcomes						
At the end of the course, the student will be able to						
CO1:	Describe the weaving and ceramic technology					
CO2:	Explain the design and construction technology					
CO3:	Analyse the manufacturing technology					
CO4:	Describe the agriculture and irrigation technology					
CO5:	Explain the Scientific Tamil and Tamil Computing					
Course Assessment methods						
Direct				Indirect		
CIE test I (30)		Total CIE: 100 marks		Course end survey		
CIE test II (30)		Semester End Examination: NIL				
CIE test III (40)						
Unit 01: WEAVING AND CERAMIC TECHNOLOGY						3 Hours
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries						
Unit 02: DESIGN AND CONSTRUCTION TECHNOLOGY						3 Hours
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.						
Unit 03: MANUFACTURING TECHNOLOGY						3 Hours
Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described inSilappathikaram.						
Unit 04: AGRICULTURE AND IRRIGATION TECHNOLOGY						3 Hours
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoempu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society						
Unit 05: SCIENTIFIC TAMIL & TAMIL COMPUTING						3 Hours
Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries –Sorkuvai Project						
Theory: 15 Hrs		Tutorial: --	Practical: --	Project:--	Total Hours: 15 Hrs	
TEXT BOOKS						
1.	தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).					
2.	கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்). கிழங்கு – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) பொருளை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)					

REFERENCES

1.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2.	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
3.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
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HOD

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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.				

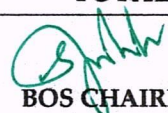
S. Anita
6/02/2024

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

U23BM203		ELECTRICAL AND ELECTRONICS FOR MEDICAL DEVICES LABORATORY					L	T	P	J	C				
							0	0	2	0	1				
Course Outcomes															
At the end of the course, the student will be able to															
CO1:	Understand and apply circuit theorems and concepts in engineering applications.														
CO2:	Analyze the Semiconductor Device Characteristics.														
CO3:	Proficiency in using virtual labs to simulate and study electrical machines.														
Pre-requisite:															

CO/PO, PSO Mapping (3/2/1 indicates the strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	-	1	-	-	2	-	-	1	2	1	-
CO2	3	3	2	2	-	1	-	-	2	-	-	1	2	1	-
CO3	3	3	2	2	3	1	-	-	2	-	-	1	2	1	-
Course Assessment methods															
Direct											Indirect				
CIE test I (15)						RTPS (10)					Course end survey				
Quiz 1 (5)						Record (10)									
CIE test II (15)						Total CIE:60 marks									
Quiz 2 (5)						Semester End Examination (40 marks)									
LIST OF EXPERIMENTS															
1	Verification on ohms law.														
2	Verification on KCL, KVL.														
3	Determination of Thevenin's and Norton's analysis of the circuit.														
4	V-I Characteristics of given PN junction Diode.														
5	V-I Characteristics of Zener Diode.														
6	Design a Half-wave and Full-wave rectifiers with a simple capacitor filter.														
7	Analyse the Characteristics of Photodiode.														
8	Determination of Input and output characteristics of BJT in CB, CC & CE configuration.														
9	Analyse the Input and Output Characteristics V-I Characteristics of FET.														
10	Study and analyse the speed control of DC Motor by using a Virtual Labs simulation.														
11	Study and analyse the speed control of the DC Generator by using a Virtual Labs simulation.														
12	Study and analyse the clockwise and anticlockwise rotation of the Stepper motor by using a Virtual Labs simulation.														
											TOTAL : 30 HOURS				


ACADEMIC COORDINATOR
 Mr.K.Manikandan
 AP/BME


BOS CHAIRMAN
HOD-BME
S. PRABAKAR, M.E., Ph.D.
 Professor and Head

Department of Biomedical Engineering
 College of Regulations 2023

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

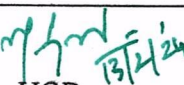
Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology,
 Salem

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							

M. Renuga
HOD 13/2/24

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

U23OL1203	Japanese - II	L	T	P	J	C
		1	0	0	0	1
Course Outcomes						
At the end of the course, the student will be able to						
CO1:	Use verbs in polite conversation or for dissuasion and describe two different activities					
CO2:	Demonstrate the application of causative verbs and those that express ability or possibility, and describe experiences					
CO3:	Use plain-style expressions, those that state opinions, and verbs and adjectives that go with nouns					
CO4:	Express sentences that use 'when' and 'if' and those that describe how services are given and received					
CO5:	Read 126 letters of Kanji, and demonstrate adequate knowledge of the lessons learnt in Levels I and II to pass the Japanese Language Proficiency Test (JLPT) for the N5 Level					
Course Assessment methods						
Direct			Indirect			
CIE test I (30)	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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Department of Humanities & Languages,
Sona College of Technology,

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
 HOD

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