

E.G.S. PILLAY ENGINEERING COLLEGE*(Autonomous)***NAGAPATTINAM – 611 002.**(Affiliated to Anna University, Chennai | Accredited by NAAC with 'A++'
Grade

Accredited by NBA | Approved by AICTE, New Delhi)

**REGULATIONS - R2023****B.E. / B.Tech. – FIRST SEMESTER CURRICULUM****MECHANICAL ENGINEERING**

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	C	MAX. MARKS		
							CA	ES	TOTAL
Theory Courses									
2301IP101	Induction Program	-	0	0	0	0	0	0	0
2301MA103	Matrices and calculus	BSC	3	1	0	4	40	60	100
2301PH102	Applied Physics for Mechanical and Civil Engineers	BSC	3	0	0	3	40	60	100
2301CH104	Materials Chemistry	BSC	3	0	0	3	40	60	100
2301GEX04	Problem Solving using Python	ESC	2	0	4	4	50	50	100
2301ENX01	Professional English	HSMC	2	0	0	2	40	60	100
2301TA101	Heritage of Tamils / தமிழர் மரபு	HSMC	1	0	0	1	100	0	100
Laboratory Courses									
2301PHX51	Engineering Physics Laboratory	BSC	0	0	2	1	60	40	100
2301CHX51	Engineering Chemistry Laboratory	BSC	0	0	2	1	60	40	100
2301ENX51	Communication Skills Laboratory	HSMC	0	0	2	1	100	0	100
2301GEX52	Engineering Practices Laboratory	ESC	0	0	4	2	60	40	100
2301LS101	Life Skills – I	-	0	0	0	0	100	0	100
TOTAL			14	1	14	22	690	410	1100

2301MA103	MATRICES AND CALCULUS (Common to Mechanical & Civil)	L	T	P	C
		3	1	0	4

PREREQUISITE:

	1. Matrices
	2. Differentiation
	3. Integration.

COURSE OBJECTIVES:

	1. To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
	2. To familiarize the students with differential calculus.
	3. To familiarize the student with functions of several variables. This is needed in many branches of engineering.
	4. To make the students understand various techniques of integration.
	5. To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1:	Calculate the nature of the matrix using Orthogonal Transformation.
CO2:	Develop the evolutes and envelopes of given curves by means of radius and centre of curvature.
CO3:	Calculate the area and volume of a curve using double and triple integration.
CO4:	Determine the nature of series using comparison, Ratio, Leibnitz tests.
CO5:	Examine the maxima/minima for the given function with several variables by finding stationary points.

Cos Vs POs MAPPING:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1									
CO2	3	2	1									
CO3	3	2	1									
CO4	3	2	1									
CO5	3	2	1									

Cos Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1	-		
CO2	1		
CO3	1		
CO4	-		
CO5	1		

COURSE CONTENTS:

MODULE I	MATRICES	9Hours
Characteristic equation-Eigen Values and Eigenvectors of a real matrix –Properties of Eigen values- Problem solving using Cayley-Hamilton-Similarity Transformation-Orthogonal Transformation of a Symmetric matrix to diagonal form –Quadratic form- Orthogonal reduction to canonical form.		
MODULE II	DIFFERENTIAL CALCULUS	9Hours
Curvature in Cartesian co-ordinates–Centre and radius of curvature–Circle of curvature- Evolutes and involutes.		
MODULE III	INTEGRAL CALCULUS	9Hours
Double integration – Cartesian and polar coordinates – Change the order of Integration – Applications: Area of a curved surface using double integral – Triple integration in Cartesian co-ordinates – Volume as triple integral.		
MODULE IV	SEQUENCES AND SERIES	9Hours

Convergence of sequence and series, tests for convergence; Power series, Taylor's series, Series for exponential, trigonometric and logarithm functions.

MODULE V	PARTIAL DIFFERENTIATION:	9Hours
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Partial derivatives, total derivative; Maxima, minima and saddle points; Method of Lagrangemultipliers.

TOTAL:45+15= 60HOURS

REFERENCES:

1. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2018.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. Ramana B.V., Higher Engineering Mathematics, Tata Mc Graw Hill New Delhi, 11th Reprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

2301PH102	APPLIED PHYSICS FOR MECHANICAL AND CIVILL ENGINEERS	T	P	C
		3	0	0

PREREQUISITE:

1. Basic knowledge in physics

COURSE OBJECTIVES:

1. To make the students effectively to achieve an understanding of mechanics
2. To introduce the basics of oscillations, optics and lasers
3. Equipping the students to be successfully understand the importance of quantum physics
4. To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications
5. To give an introduction to the processing and applications of new engineering materials

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

- CO1:** Understand the importance of mechanics
- CO2:** Outline the different types of lasers and compare the different types of optical fibers based on mode and refractive index profile for data communication system
- CO3:** Understand the importance of quantum physics
- CO4:** Demonstrate a strong foundational knowledge in oscillations, optics and lasers
- CO5:** Differentiate about the processing and applications of composites, metallic glasses, shape memory alloys and ceramics

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	1						
CO2	3	3	2	2	2	1						1
CO3	3	3	1	1	2	1						
CO4	3	3	2	2	2	1						
CO5	3		2	2	2	1						

COs Vs PSOs MAPPING

Cos	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE CONTENTS:

MODULE I MECHANICS 9 Hours

Multiparticle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kinetic energy and moment of inertia - theorems of M .I –moment of inertia of continuous bodies – M.I of a diatomic molecule - torque – rotational dynamics of rigid bodies – conservation of angular momentum – rotational energy state of a rigid diatomic molecule - gyroscope - torsional pendulum – double pendulum –Introduction to nonlinear oscillations.

MODULE II	LASERS AND FIBER OPTICS	9 Hours
Theory of laser - characteristics- Spontaneous and stimulated emission - Einstein's coefficients - population inversion - Nd-YAG laser, CO2 laser, semiconductor laser –Basic applications of lasers in engineering. Fibre optics, types of optical fibers- and applications in engineering		
MODULE III	BASIC QUANTUM MECHANICS	9 Hours
Photons and light waves - Electrons and matter waves –Compton effect - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization –Free particle - particle in a infinite potential well: 1D,2D and 3D Boxes- Normalization, probabilities and the correspondence principle		
MODULE IV	OPTICAL PROPERTIES OF MATERIALS	9 Hours
Classification of optical materials – Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain. Optical processes in quantum wells – Optoelectronic devices: light detectors and solar cells – light emitting diode – laser diode - optical processes in organic semiconductor devices –excitonic state – Electro-optics and nonlinear optics: Modulators and switching devices – plasmonics.		
MODULE V	NEW ENGINEERING MATERIALS	9 Hours
Composites - Definition and Classification - Fibre reinforced plastics (FRP) and fiber reinforced metals (FRM) - Metallic glasses - Shape memory alloys - Ceramics - Classification - Crystalline - Non Crystalline - Bonded ceramics, Manufacturing methods - Slip casting - Isostatic pressing - Gas pressure bonding - Properties - thermal, mechanical, electrical and chemical ceramic fibres - ferroelectric and ferromagnetic ceramics - High Aluminium ceramics.		
TOTAL: 45 HOURS		
REFERENCES:		
1. D.Kleppner and R.Kolenkow. An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.		
2. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGrawHill (Indian Edition), 2017.		
3. Jasprit Singh, Semiconductor Optoelectronics: Physics and Technology, Mc-Graw Hill India (2019)		
4. K.Thyagarajan and A.Ghatak. Lasers: Fundamentals and Applications, Laxmi Publications, (Indian Edition), 2019.		
5. D.Halliday, R.Resnick and J.Walker. Principles of Physics, Wiley (Indian Edition), 2015.		
6. https://archive.nptel.ac.in/courses/112/103/112103108/		
7. https://archive.nptel.ac.in/courses/115/107/115107131/		

2301CH104	MATERIALS CHEMISTRY	L	T	P	C
		3	0	2	4

PREREQUISITE:

- Basic knowledge of science up to higher secondary level

COURSE OBJECTIVES:

- To make the students conversant with boiler feed water requirements, related problems and water treatment techniques
- To impart technological aspects of applied chemistry

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

- CO1:** Estimate the amount of ion present in the water sample.(K3)
CO2: Measure the percentage of corrosion using electrochemical principle. (K3)
CO3: Determine the amount of copper present in the alloy (K3)
CO4: Determine the molecular weight of the polymer. (K3)
CO5: Estimate the conduction ability of materials. (K3)

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M			L			L	L			
CO2	S	M			L			L	L			
CO3	S	M			L			L	L			
CO4	S	M			L			L	L			
CO5	S	M			L			L	L			

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3	L		
CO4	L		
CO5			

COURSE CONTENTS:

MODULE I | WATER TECHNOLOGY | 9 Hours

Hardness of water – types – expression of hardness – units – estimation of hardness of water by EDTA - Alkalinity- boiler troubles (scale and sludge) – treatment of boiler feed water – Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) external treatment – Ion exchange process, zeolite process – desalination of brackish water- Reverse Osmosis.

MODULE II | CORROSION | 9 Hours

Corrosion – principles of corrosion – Pilling – Bed worth rule – principles of electrochemical corrosion – difference between chemical and electrochemical corrosion – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – cathodic protection – sacrificial anodic method.

MODULE III | PHASE RULE AND ALLOYS | 9 Hours

Phase rule: Introduction, definition of terms with examples, one component system –water system - reduced phase rule - thermal analysis and cooling curves - two component systems - lead-silver system - Pattinson process . Alloys: Introduction-Definition- properties of alloys- significance of alloying – heat treatment of steel.

MODULE IV | FUELS AND POLYMER MATERIAL | 9 Hours

Fuels: Introduction - classification of fuels - coal - carbonization - manufacture of metallurgical coke (Otto Hoffmann method) - petroleum -manufacture of synthetic petrol (Bergius process) natural gas - compressed natural gas (CNG) - liquefied petroleum gases (LPG).Flue gas analysis(Orsat Method). Polymer -functionality – degree of polymerisation- molecular weight determination-Thermoplastic & Thermo setting- Nanoparticles embedded polymer composites.

MODULE V	NANOMATERIALS	9 Hours
<p>Nanotechnology: Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nano particles: nano cluster, nano rod, nanotube(CNT) and nanowire. Synthetic methods: chemical vapour deposition, laser ablation; synthesis of metal oxide nano particles- applications.conductive nanomaterials.</p>		
TOTAL: 45 HOURS		
REFERENCES:		
Sashi Chawla, A Text book of Engineering Chemistry, Dhanpat Rai Publishing Co., Pvt. Ltd., Educational and Technical Publishers, New Delhi, 3rd Edition, 2015.		
S. S. Dara, <i>A Text book of Engineering Chemistry</i> , S. Chand & Co Ltd., New Delhi, 20 th Edition, 2013.		
P.C. Jain and Monica Jain, A Textbook of Engineering Chemistry, DhanpatRai publications, New Delhi, 16th edition, 2015.		
Kumar Mehta P. and Paulo J. M. Monteiro, (2014), Concrete: Microstructure, Properties and Materials, 4 th Edition, McGraw-Hill, New Delhi.		
Alain Nouailhat, "An Introduction to Nanoscience and Nanotechnology", John Wiley, ISBN:978-1848210073		
https://onlinecourses.nptel.ac.in/noc23_mm01/preview		
https://onlinecourses.nptel.ac.in/noc23_me46/preview		

REFERENCES:
1. Martin C Brown, “Python The Complete Reference”, Mc Graw-Hill Education – Europe, 4 th Edition, 2018
2. Reema Thareja, “Python Programming: Using Problem Solving Approach”, Oxford University Press, 2017.
3. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, Second Edition, Shroff/O’Reilly Publishers, 2016. (http://greenteapress.com/wp/thinkpython/).
4. Ben Stephenson, “The Python workbook A brief introduction with exercises and solutions”, Springer International publishing, Switzerland 2014.
5. Guido van Rossum, Fred L. Drake Jr., “An Introduction to Python – Revised and Updated for Python 3.2”, Network Theory Ltd., 2011.
6. Charles Dierbach, “Introduction to Computer Science using Python”, Wiley India Edition, 2016.
7. Timothy A. Budd, “Exploring Python”, Mc-Graw Hill Education (India) Private Ltd., 2015.
8. https://nptel.ac.in/courses/106106182
9. https://www.learnpython.org/
10. https://www.codecademy.com/learn/learn-python
REQUIREMENTS: (A batch of 30 students)
Hardware Requirements: Standalone Desktop Computer or Server Supporting
Software Requirements: Python Interpreter Version 3

2301ENX02	PROFESSIONAL ENGLISH	L	T	P	C
	Common to B.E /B.Tech Programme (CIVIL, BME, CSE, ECE, EEE, IT, MECH)	2	0	0	2

PREREQUISITE:

1. Basic English Knowledge

COURSE OBJECTIVES:

CO1	To improve the communicative competence of learners.
CO2	To learn using of basic grammatical structures in suitable contexts.
CO3	To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text.
CO4	To help learners in using the language effectively in professional contexts.
CO5	To use the language efficiently in expressing their opinions.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1:	Use appropriate words in a professional context
CO2:	Gain understanding of basic grammatical structures and use them in right context.
CO3:	Read and interpret information presented in tables, charts and other graphic forms
CO4:	Write definitions, descriptions, narrations and essays on various topics
CO5:	Speak fluently and accurately in formal and informal communicative contexts.

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		
CO2										3		
CO3										3		
CO4										3		
CO5										3		

COs Vs PSOs MAPPING

Cos	PSO1	PSO2	PSO3
CO1	-	-	-
CO2	-	-	-
CO3	-	-	-
CO4	-	-	-
CO5	-	-	-

COURSE CONTENTS:

MODULE I FUNDAMENTALS OF COMMUNICATION 9 Hours

Reading - Reading brochures (technical context)/ user manuals/, telephone messages / social media messages relevant to technical contexts and emails. Writing - Professional emails etiquette, emails / letters (seeking permission for Industrial visit& Complain letter) Grammar - Present Tense (simple and progressive); Question types: Why/ Yes or No/ and Tags. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms, Punctuation.

MODULE II NARRATION AND SUMMATION 9 Hours

Reading - Reading longer technical texts (Reading biographies/ travelogues/ newspaper reports/ travel & technical blogs). Writing - Paragraph writing Short Report on an event (field trip etc.), emails / letters (Writing responses to complaints). Grammar -Past tense (simple); Subject-Verb Agreement. Vocabulary – Preposition, Prepositional Phrases & Phrasal verbs.

MODULE III	DESCRIPTION OF A PROCESS / PRODUCT	9 Hours
Reading – Reading advertisements, gadget reviews. Writing – instructions, Checklists, Report Writing (Accident Report & Survey Report (IV)). Grammar – Present & Past Perfect Tenses, Voices (Active ,Passive & Impersonal Passive Voice); Vocabulary – Collocations, Homonyms; and Homophones,		
MODULE IV	CLASSIFICATION AND RECOMMENDATIONS	9 Hours
Reading – Newspaper articles; Journal reports –and Non Verbal Communication (tables, pie charts etc.); Writing- Job / Internship application – Cover letter & Resume ,recommendations. Grammar – Articles, Adjectives of Comparison, If conditional sentences Vocabulary – Conjunctions, discourse markers (connectives & sequence words)		
MODULE V	EXPRESSION	9 Hours
Reading – Company profiles, standard operating procedure (SOP)/ an excerpt of interview with professionals. Writing – Essay Writing (Descriptive or narrative), Grammar – Future Tenses, Numerical adjectives, Relative Clauses. Vocabulary - Cause & Effect Expressions – Content vs Function words.		
TOTAL: 45 HOURS		
REFERENCES:		
1. Technical Communication – Principles And Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.		
2. A Course Book On Technical English By Lakshminarayanan, Scitech Publications (India) Pvt. Ltd.		
3. English For Technical Communication (With CD) By Aysha Viswamohan, Mcgraw Hill Education, ISBN : 0070264244.		
4. Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House.		
5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.		
6. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press. New Delhi		
7. New Delhi. 2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, NewDelhi.		

2301TA101	தமிழர்மரபு/ HERITAGE OF TAMILS	L	T	P	C
		1	0	0	1

PREREQUISITE:

Cultural and Heritage of Tamil People. And about Sangam Literature, Religion, Art & Architecture during ancient Period. And also about Classical Tamil Literature, Epigraphy, Inscriptions, Non-Tamil source

COURSE OBJECTIVES:

- To preserve and expose the cultural heritage of our ancestors and teachers
- To evoke surprise and admiration by creating accessibility to their work, products, and minds.
- To promote the practice of science and other cultural activities.

COURSE OUTCOMES:

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

- CO1:** To use Learning and understanding the development of modern literature.
- CO2:** To acquire the kinds of modern literature and the development of modern literature.
- CO3:** To learn the Tamil Drama Literature, its origin, development; authors Understand the difference between drama of historic period and nowadays. Impact of modern theories in theatre art
- CO4:** To develop the medieval literature and to know the impact of religious literature through the ages
- CO5:** To speak the human values and rights in Tamil literature. Learn to respect the people who live with them Respect the people without the basis Gender, Race and economic status.

COsVsPOsMAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		
CO2										3		
CO3										3		
CO4										3		
CO5										3		

COURSE CONTENTS:

MODULE I 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.

அலகு I மொழி மற்றும் இலக்கியம்: 3
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.

MODULE II 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.

அலகு II மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை: 3

நடுகல் முதல் நவீன 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.

MODULE III FOLK AND MARTIAL ARTS 3 Hours

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

அலகு III நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்: 3
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

MODULE IV 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.

அலகு IV தமிழர்களின் திணைக் கோட்பாடுகள்: 3
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.

MODULE V 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.

அலகு V இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு: 3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிக்கள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL: 15 HOURS

REFERENCES:

1. தமிழகவரலாறு– மக்களும் பண்பொடும்– மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடுபொடநூல்மற்றும் கல்வியியல்பணிகள் கழகம்).
2. கணினித்தமிழ்– முமனவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
3. கீழடி– மவமகநதிக்கமரயில் ஂங்ககொலநகரநொகரிகம் (ததொல்லியல்துமற தவளியீடு)
4. தபொருமந– ஆற்றங்கமரநொகரிகம். (ததொல்லியல்துமற 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.

2301PHX51	ENGINEERING PHYSICS LABORATORY	L	T	P	C
(Common for all branches)		0	0	2	1

PREREQUISITE:

- Basic knowledge in physics

COURSE OBJECTIVES:

- To learn the proper use of various kinds of physics laboratory equipment
- To learn how data can be collected, presented and interpreted in a clear and concise manner.
- To learn problem solving skills related to physics principles and interpretation of experimental data.
- To determine error in experimental measurements and techniques used to minimize such error.
- To make the student an active participant in each part of all lab exercises

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1:	Utilize the concept of twisting couple to find the Rigidity Modulus and Moment of Inertia of a wire.
CO2:	Experiment with properties of materials to find the Young's modulus of the material under uniform bending
CO3:	Choose the concept of streamline flow of liquids in capillary tubes and measure the viscosity of liquids.
CO4:	Test the phenomenon of interference of light by forming fringes and find the thickness through air-wedge method.
CO5:	Determine the particle size and wavelength of laser source through diffraction phenomenon.
CO 6	Examine the velocity and wavelength of ultrasonics in a liquid and compressibility of the liquid.

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	1						
CO2	3	3	2	2	2	1						1
CO3	3	3	1	1	2	1						
CO4	3	3	2	2	2	1						
CO5	3		2	2	2	1						

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

LIST OF EXPERIMENTS (Any 7 experiments to be performed)

1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of regular and irregular objects.
2. Simple harmonic oscillations of cantilever.
3. Non-uniform bending - Determination of Young's modulus
4. Uniform bending – Determination of Young's modulus
5. Laser- Determination of the wavelength of the laser using grating

6. Air wedge - Determination of thickness of a thin sheet/wire
7. a) Optical fibre -Determination of Numerical Aperture and acceptance angle b) Compact disc- Determination of width of the groove using laser.
8. Acoustic grating- Determination of velocity of ultrasonic waves in liquids.
9. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids
10. Determination of Band gap of a semiconductor.
11. Poiseuille's method for finding viscosity of a liquid
12. Lee's Disc-Thermal conductivity of bad conductor
13. Spectrometer-determination of wavelength using grating
References
<ul style="list-style-type: none"> • 1. Practical Physics', R.K. Shukla, AnchalSrivastava, New age international (2011 • 2. B.Sc. Practical Physics', C.L Arora, S. Chand &Co. (2012)

2301CHX51	ENGINEERING CHEMISTRY LABORATORY	L	T	P	C
COMMON TO ALL BRANCHES			0	0	2

PREREQUISITE:

- Basic knowledge of science up to higher secondary level

COURSE OBJECTIVES:

- To make the students conversant with boiler feed water requirements, related problems and water treatment techniques
- To impart technological aspects of applied chemistry

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1: Estimate the amount of ion present in the water sample.(K3)

CO2: Determine the pH of the solutions. (K3)

CO3: Estimate the corrosion behavior of metals. (K3)

CO4: Determine the acid content using electrochemical principles. (K3)

CO5: Determine the molecular weight of the polymer. (K3)

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M			L			L	L			
CO2	S	M			L			L	L			
CO3	S	M			L			L	L			
CO4	S	M			L			L	L			
CO5	S	M			L			L	L			

COs Vs PSOs MAPPING

Cos	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

LIST OF EXPERIMENTS

1. Determination of total, temporary & permanent hardness of water by EDTA method
2. Comparison of alkalinities of the given water samples
3. Estimation of iron content of the given solution using potentiometer
4. Corrosion experiment – weight loss method
5. Conductometric titration of strong acid Vs strong Base
6. Determination of molecular weight of a polymer by viscometry method
7. Determination of percentage of copper in alloy
8. Determination of ferrous iron by Spectrophotometry method
9. Estimation of calcium present in cement.
10. Determination of strength of given hydrochloric acid using pH meter

11. Estimation of sodium ion present in water by flame photometer.

12. Estimation of dissolved oxygen in a water sample/sewage by Winklers method.

13. Synthesis of metal oxide nanoparticles by chemical method.

REFERENCES:

- Experimental organic chemistry, Daniel R. Palleros, John Wiley & Sons, Inc., New Yor (2001)
- Engineering Chemistry”, Jain & Jain, 15th edition, Dhanpat Rai Publishing company, New Delhi
- Vogel’s Textbook of practical organic chemistry, Furniss B.S. Hannaford A.J, Smith P.W.G and Tatchel A.R LBS Singapore (1994)
- LBS Singapore (1994). Kolthoff I.M., Sandell E.B. et al Mcmillan, Madras 1980

2301GEX52	Engineering Practices Laboratory											L	T	P	C		
0															0	4	2
PREREQUISITE: NIL																	
COURSE OBJECTIVES:																	
1. To provide hands on training for fabrication of components using sheet metal and welding equipment / tools.																	
2. To develop skill for using carpentry and fitting tools to make simple components and metal joints.																	
3. To provide training for making simple house hold pipe line connections using suitable tools.																	
4. To develop the skill to make / operate/utilize the simple engineering components.																	
COURSE OUTCOMES:																	
On the successful completion of the course, students will be able to																	
CO1: Fabricate simple components using sheet metal using suitable tools.																	
CO2: Prepare simple components using suitable fitting tools.																	
CO3: Fabricate simple components using welding equipments.																	
CO4: Make simple components / joints using carpentry power tools.																	
CO5: Make simple house hold pipe line connections using suitable tools.																	
COs Vs POs & PSOs MAPPING:																	
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2	PS O3		
CO1	2								2			1	-	2	-		
CO2	2	1							2			1	-	2	-		
CO3	2	1			1				2			1	-	2	-		
CO4	2	1			1				2			1	-	2	-		
CO5	2								2			1	-	1	-		
LIST OF EXPERIMENTS																	
1. Forming of simple object in sheet metal using suitable tools.(Example: Dust Pan, Rectangular tray and Cone making)													6 Hours				
2. Prepare V (or) Half round (or) Square (or) Dovetail joint from the given mild Steel flat.													5 Hours				
3. Fabrication of a simple component using thin and thick plates using arc welding. (Example: Butt , Lap and T - Joints)													6 Hours				
4. Making a simple component using carpentry power tools.(Example: Cross Lap, T-Lap, Dove tail joints and Electrical switch box / Tool box / Letter box)													6 Hours				
5. Construct a household pipe line connections using pipes, Tee joint, four way joint, elbow, union, bend, Gate valve and Taps.													5 Hours				
6. Study of gas welding equipment and its demonstration.													2 Hours				
Total : 30 Hours																	
References:																	
1. S. Gowri & T.Jeyapoovan, "Engineering Practices Lab Manual" 5th Edition, Vikas Publishing.																	
2. Dr. V. Ramesh Babu," Engineering Practices Laboratory Manual" Revised Edition 2019-20, VRB Publishers Pvt. Ltd.																	

2301ENX51	COMMUNICATION SKILLS LABORATORY				L	T	P	C				
	Common to B.E /B.Tech Programme (CIVIL,BME,CSE,ECE,EEE,IT,MECH and AI&DS)				0	0	2	1				
PREREQUISITE:												
1. Basic English Knowledge												
COURSE OBJECTIVES:												
CO1	To facilitate computer-aided multi-media instruction enabling individualized and independent language learning											
CO2	To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking.											
CO3	To prepare them to use communicative language and participate in different types of speaking environments.											
CO4	To expose the Students to participate in group discussions, debates with ease.											
CO5	To enable the students become strong in LSRW skills.											
COURSE OUTCOMES:												
On the successful completion of the course, students will be able to												
CO1:	Improve their listening, reading, speaking and writing skills.											
CO2:	Develop their communication competency.											
CO3:	Use language effectively in professional contexts.											
CO4:	Develop the ability to face campus interviews.											
CO5:	Use language efficiently in expressing their opinions											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		
CO2										3		
CO3										3		
CO4										3		
CO5										3		
COs Vs PSOs MAPPING												
	Cos	PSO1	PSO2	PSO3								
	CO1	-	-	-								
	CO2	-	-	-								
	CO3	-	-	-								
	CO4	-	-	-								
	CO5	-	-	-								
COURSE CONTENTS:												
MODULE I	LISTENING							6 Hours				
Listening for general information-specific details Audio / video (formal & informal). Listening IELTS/TOFEL/ TED Talks and educational videos. Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Listening - Listen to product and process descriptions; and advertisements about products. Listening – Listening to debates/ discussions; different viewpoints on an issue; and panel discussions.												
MODULE II	SPEAKING							6 Hours				
Self-Introduction - Role play exercises based on workplace contexts- Group discussion (Discussing advantages and disadvantages/ purposes and reasons)- Discussing progress toward goals- Discussing past events in life- Making telephone calls (politeness strategies- making polite requests, making polite offers, replying to polite requests and offers) Interpreting (Picture, locations in workplaces).												
MODULE III	READING							6 Hours				

Reading– Intensive Reading -Comprehending general and technical articles -Cloze reading - Inductive reading- Short narrative and descriptions from newspapers – Skimming and scanning-reading and interpretation-Critical reading Interpreting and transferring graphical information- Sequencing of sentences..	
MODULE IV	WRITING 6 Hours
Writing- Precise writing –Summarizing- Interpreting visual texts (pie chart, bar chart, picture, advertisements etc., - Proposal writing (launching new units or department in a institution or industry & to get loan from bank) -Report writing (accident, progress, project, survey, Industrial visit)- Job application-Resume.	
MODULE V	PERSONALITY DEVELOPMENT 6 Hours
Introduction to life skills -emotional intelligence (visualizing and experiencing purpose)-Self-awareness - Time management- Stress management - Leadership- teamwork & dealing with ambiguity- -interview planning- Mock Interviews— Self-Concept. Organizational etiquette.	
TOTAL: 30 HOURS	
REFERENCES:	
Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House.	
Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.	
New Delhi. 2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, NewDelhi.	
Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.	
Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.	
https://swayam.gov.in/explorer?searchText=english (Link for NPTEL/SWAYAM/MOOC Courses)	
https://ieltsionlinetests.com (Link for modern tool usage)	