



TAKSHASHILA UNIVERSITY

(Tamil Nadu State Private University)
ONGUR, TINDIVANAM TK, VILLUPURAM DT

FACULTY OF SCIENCES

SCHOOL OF BASIC SCIENCES

Department of Chemistry

**REGULATION 2025 NEP
CURRICULUM & SYLLABI**

II Semester UG



VISION AND MISSION OF UNIVERSITY

VISION:

To inspire, develop and create change makers and world leaders of tomorrow through knowledge similar to the ancient Takshashila University

MISSION:

Nurturing and developing the leaders of tomorrow with the brightest minds and best resources, fostering lifelong and ethical excellence.

DEPARTMENT VISION AND MISSION

VISION:

- To be a center of excellence in fundamental sciences through innovative teaching and research
- To nurture scientific curiosity and critical thinking among students
- To contribute to societal development through scientific knowledge and discovery

MISSION:

M1: Academic Excellence and Skill Development	To provide high-quality chemistry education that integrates fundamental knowledge, advanced scientific concepts, and hands-on laboratory training to prepare students for academic, industrial, and research careers
M2: Research, Innovation, and Interdisciplinary Collaboration	To promote cutting-edge research, innovation, and interdisciplinary collaboration in emerging areas of chemical sciences, nanotechnology, materials science, environmental sustainability, and healthcare
M3: Professional Competency, Ethics, and Leadership	To develop professionally competent graduates with critical thinking, leadership, communication skills, ethical values, and a commitment to lifelong learning and societal development
M4: Industry Engagement and Sustainable Development	To strengthen industry-academia partnerships, entrepreneurship, and sustainable scientific practices that address global challenges and contribute to technological and socioeconomic progress

PROGRAMME OUTCOMES (POs)

PO1: Disciplinary Knowledge

Demonstrate comprehensive knowledge of the fundamental principles and advanced concepts of chemistry, including organic, inorganic, physical, and analytical chemistry.

PO2: Analytical and Critical Thinking

Develop the ability to analyze chemical data, evaluate scientific evidence, interpret experimental results, and apply critical thinking to draw conclusions and make informed decisions.

PO3: Problem Solving

Identify, formulate, and solve theoretical and practical chemical problems using scientific methods, quantitative reasoning, and appropriate experimental techniques.

PO4: Effective Communication

Communicate scientific ideas, experimental findings, and research outcomes effectively through oral presentations, laboratory reports, and digital communication while maintaining scientific accuracy.

PO5: Modern Tool Usage

Acquire proficiency in the use of modern laboratory instruments, analytical techniques, computational tools, information technology, and safety practices relevant to chemistry and scientific research.

PO6: Ethics and Values

Demonstrate professional ethics, environmental responsibility, laboratory safety awareness, academic integrity, and a commitment to sustainable development in scientific practice.

PO7: Teamwork and Leadership

Work effectively as an individual and as a member or leader of multidisciplinary teams, demonstrating collaboration, responsibility, leadership qualities, and interpersonal skills to achieve common goals.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Professional Knowledge

Apply contemporary chemical knowledge and emerging technologies to address challenges in research, industry, healthcare, energy, and environmental sustainability.

PEO2: Research and Development

Apply advanced chemical principles, experimental techniques, and analytical skills to investigate scientific problems and contribute to research and innovation in chemistry and nanotechnology.

PEO3: Leadership

Demonstrate leadership, teamwork, and effective communication skills in planning, executing, and managing scientific and laboratory-based activities.

PEO4: Professional Ethics

Graduates will practice ethical values, environmental awareness, teamwork, and effective communication while contributing responsibly to society.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Domain Knowledge

Demonstrate a thorough understanding of the fundamental concepts of organic, inorganic, physical, analytical, industrial and environmental chemistry.

PSO2: Professional Competency

Practice ethical conduct, laboratory safety, environmental responsibility, and integrity in scientific research and professional activities.



**TAKSHASHILA
UNIVERSITY**

(Established under Tamil Nadu State Private Universities Act 2019 &
Recognized by UGC w.e 2(i) of the UGC Act, 1956)

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FACULTY OF SCIENCES

DEPARTMENT OF CHEMISTRY (B.Sc.CHEMISTRY)

(REGULATION 2025 NEP)

SEMESTER – II

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Hrs.	Max. Marks								
				L	T	P			CAT I, II, III (Best of Two)	ASS	MCQ	ATT	SEM	PRA	CAM	ESM	Total
1	U25CH02B	General Chemistry – II	DSC	3	0	2	4	75	20	5	5	5	5	50	40	60	150
2	U25PH04B	Physics–II	DSC	3	0	2	4	75	20	5	5	5	5	50	40	60	150
3	U25MA11T	Mathematics – II	IDC	3	1	0	4	60	20	5	5	5	5	-	40	60	100
4	U25CS66T	Fundamentals of Python	MDC	1	0	2	2	45	-	-	-	-	-	-	100	-	100
Total:							14										
5	U25TA05T/ U25FR02T	Tamizhum Ilakkanamum/ French- II	AEC	2	0	0	2	30	20	5	5	5	5	-	40	60	100
6	U25EN07T	Functional English	AEC	2	0	0	2	30	20	5	5	5	5	-	40	60	100
7	U25CH03B	Synthetic Chemistry Laboratory Techniques	SEC	1	0	2	2	45	-	-	-	-	-	-	100	-	100
8	U25VA03B	Health Wellness and Yoga Education	VAC	2	0	0	2	30	-	-	-	-	-	-	100	-	100
Total:							8										
Total:							22	390						100	500	300	900

Note:

L – Lecture

P – Practical

ESM – End Semester Exam Marks

ASS – Assignment

CAM– Continuous Assessment Marks

T – Tutorial

CAT – Continuous Assessment Test

ATT– Attendance

SEM – Seminar

K.V. 2
BoS Chairman

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U25CH02B	General Chemistry – II	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

• To understand the alkali and alkaline earth metals, properties and occurrence
• To study the basics of p-block elements of various compounds
• To demonstrate the various hydrocarbons, preparation and its applications
• To analyze the various types of solid materials and its structure
• To adhere to laboratory safety protocols, including the proper handling and disposal of chemicals

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Understand of periodic trends in the s-block elements, including atomic and ionic sizes, ionization energies, and reactivity.
CO2 :	Analyze the chemical behavior and compounds of p-block elements, including hydrides, oxides, halides, and complex compounds.
CO3 :	Study the classification, formulas and structural features of hydrocarbons into alkanes, alkenes, alkynes, and aromatic hydrocarbons.
CO4 :	Evaluate the electronic properties of solids, including band theory and electrical conductivity.
CO5 :	Comprehend the fundamental principles of chemical laboratory safety.

UNIT I :S-BLOCK ELEMENTS	9 Hrs.
Alkali metals - Li, Na, K, Rb and Cs – Occurrence – Comparative study of Elements with respect to Oxides, Halides, Hydroxides and Carbonates – Exceptional property of Lithium – Alkaline earth metals – Be, Mg, Ca, Sr and Ba – Occurrence – Comparative study of the elements with respect to Oxides, Hydroxides, Halides, Sulphates and Carbonates – Comparison of Alkaline Earth Metals with Alkali Metals – Magnesium acting as bridge element between II A and II B groups – Magnesium resembles Zinc.	

UNIT II :P-BLOCK ELEMENTS	9 Hrs.
P - Block elements - Boron family – Group discussion – Anomalous behaviour of Boron – Diagonal Relationship between Boron and Silicon – Electron deficiency and Electron acceptor behaviour of Boron	

trihalides – Bonding in Diborane (Hydrogen bridge structure) - Preparation, Properties, structure and Uses of Borazine, NaBH_4 , LiAlH_4 and boron nitride.

UNIT III :HYDROCARBONS

9 Hrs.

Alkanes – Methods of preparation of alkanes – Wurtz method, Kolbe's method and Reduction of alkyl halides – Physical and Chemical Properties of alkanes – Mechanism of Free Radical Substitution in alkanes – Alkenes – Properties of alkenes – Electrophilic and Free radical addition – Addition reactions of Alkenes with mechanism – Addition of Hydrogen, Halogens, 16 Hydrogen Halide (Markownikof's rule) – Hydrogen bromide (Peroxide effect) – Alkynes – Acidity of alkynes – Addition of hydrogen – Hydroboration – Hydrohalogenation – Addition of hypohalous acid, Hydration - Addition of water with HgSO_4 catalyst – Oxidation with KMnO_4 .

UNIT IV :SOLID STATE

9 Hrs.

Introduction to solid state – differences between crystalline and amorphous solids– isotropy and anisotropy – interfacial angle-symmetry in crystal systems– Elements of symmetry, space lattice & unit cell– Bravais lattices– Law of rationality of indices– Miller indices – X ray diffraction – Braggs – equation Experimental methods, Structure of NaCl , CsCl , ZnS – Band theory and defects in solids.

UNIT IV :SAFTY ASPECTS IN CHEMICAL LABORATORY

9 Hrs.

Safety aspects in Chemical Laboratory – Emergency procedures – Safe handling and calibration of glassware – Safety in storage and handling of materials and precautions – Handling of balances, thermostat, muffle furnaces – Assembling of distillation apparatus – other glass apparatus - Recording of observations and graphical representations.

Total Hours: 45

List of Experiments:

Qualitative analysis

Semi-micro Analysis of inorganic mixture containing four cations out of which two will be rare metal ions such as W, Mo, Se, Ti, Zr, Ce, Th, V and U. (Spot Test for individual cations should be performed).

Total Hours: 30

K.V.

TEXTBOOKS:

1.	Puri B.R., Sharma L.R., Kalia K.K. Principles of Inorganic chemistry, (33rd edition), New Delhi, Shoban Lal Nagin Chand.Co, 2020.
2.	R. Gopalan, P.S.Subramanian, K.Rangarajan , Analytical Chemistry, New age, Sultan Chand & Sons Publishing Year: 2003.
3.	Morrison R.T. and Boyd R.N., Organic Chemistry (6th edition), Ny, Allyn & Beecon Ltd., 1976.
4.	Soni P.L., and Chawla H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons, 2007.
5	West, A. R. Solid State Chemistry and its Applications, John Wiley & Sons: New York,1989.

REFERENCE BOOKS:

1.	Lee JD, Concise inorganic Chemistry, 5edition, 2022, Chapman & Hall, London,1996.
2.	J.E. Huheey, E. A. Keiter and R. L.Keiter "Inorganic Chemistry, Principles of structure and Reactivity", 4thEdn. Harper Collin College Publishers, 1993.
3.	Basic Organic Chemistry, Ramesh Chandra, Snigdha Singh, Aarushi Singh, Arcler Education Inc, 2019.
4.	Kolthoff & Sandell - Text Book of Qualitative Inorganic Analysis, 6th edn., revised by G.Svehla, Orient Longman, 1979.
5	G. H. Geeffery et al., Vogel's Textbook of Quantitative Chemical Analysis, ELBS Edn, 1989.

WEB RESOURCES

1.	https://nptel.ac.in/courses/115106127
2.	https://nptel.ac.in/courses/104101090
3.	https://nptel.ac.in/courses/103107156


BoS Chairman

U25PH04B	Physics - II	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

To understand the principles of physical optics, including interference, diffraction and polarization of light
To explain the structure of atoms, quantum numbers, atomic models and the electronic configuration of elements.
To acquire knowledge of nuclear models, nuclear reactions, radiation detectors and applications of nuclear energy
To understand the fundamental concepts of special relativity and quantum mechanics, and solve simple quantum mechanical problems
To develop an understanding of basic analog and digital electronic devices, circuits and logic design principles

COURSEOUTCOMES:

After completion of the course, the students will be able to

CO1 :	Explain the principles and applications of interference, diffraction and polarization in physical optics.
CO2 :	Describe atomic structure, quantum numbers, electronic configuration and important experimental concepts in atomic physics.
CO3 :	Analyze nuclear structure, nuclear reactions, radiation detection techniques and the applications of nuclear energy
CO4 :	Apply the concepts of special relativity and quantum mechanics to explain physical phenomena and solve elementary quantum mechanical problems.
CO5 :	Analyze the operation of basic electronic devices, amplifiers, oscillators and digital logic circuits including Boolean algebra, logic gates, adders and subtractors.

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UNIT I :PHYSICAL OPTICS	9 Hrs.
Velocity of light - Michelson's method. Interference: Colours of thin film – air wedge – determination of diameter of a thin wire by air wedge – test for optical flatness. Diffraction – Fresnel's explanation of rectilinear propagation of light – theory of transmission grating – Normal incidence – Polarisation – double refraction, optical activity – polarimeter.	
UNIT II :ATOMIC PHYSICS	9 Hrs.
Atom model – vector atom model – electron, spin, quantum numbers – Pauli's exclusion Principle - electronic configuration of elements and periodic classification of elements – various quantum numbers – magnetic dipole moment of electron due to orbital and spin motion – Bohr magneton – spatial quantization – Stern and Gerlach experiment.	
UNIT III :NUCLEAR PHYSICS	9 Hrs.
Nuclear model – liquid drop model – magic number, shell model – nuclear energy – mass defect – binding energy. Radiation detectors – ionization chambers – GM Counter – Fission Controlled and Uncontrolled chain reaction – nuclear reactor – thermonuclear reaction – stellar energy.	
UNIT IV : ELEMENTS OF RELATIVITY AND QUANTUM MECHANICS	9 Hrs.
Postulates of theory of relativity – Lorentz transformation equations – derivation – length contraction – time dilation – mass energy equivalence – uncertainty principle – postulates of wave mechanics – types of operators – Schrodinger's equation – application to a particle in a box.	
UNIT V : ELECTRONICS	9 Hrs.
Basic Electronics: Zener diode – Voltage regulator – LED – Transistor RC coupled amplifier – feedback principle – condition for oscillation – Phase shift oscillator – Wien's bridge oscillator. Digital Electronics: NAND and NOR gates – Universal building blocks – Boolean algebra – De Morgan's theorem – verification – elementary ideas of ICs – SSI, MSI, LSI and VLSI – Half adder, Full adder, Half Subtractor and Full Subtractor.	

Total Hours: 45

List of Experiments:

1. Determine the thickness of a thin wire (or a thin sheet of paper) using the interference phenomenon in an air wedge formed by two optically plane glass plates.
2. Determine the radius of curvature of a given Plano-convex lens using Newton's rings method.
3. Determine the wavelength of the prominent spectral lines of mercury using a plane transmission diffraction grating and a spectrometer.
4. Determine the refractive index of the material of a given prism by drawing the graph between the angle of incidence (i) and the angle of deviation (d), and finding the angle of minimum deviation.
5. Determine the refractive index of the material of a given prism by drawing the graph between the angle of incidence (i) and the angle of emergence (i'), using the principle of reversibility of light.
6. Determine the specific resistance (resistivity) of the material of a given wire using a Post Office Box based on the Wheatstone's bridge principle.
7. Construct the basic logic gates — AND, OR, and NOT — using diodes and a transistor, and to verify their truth tables.
8. Realize the basic logic gates (AND, OR, NOT) using only NAND gates and thereby verify that NAND is a universal gate.
9. Study the forward and reverse bias V-I characteristics of a given Zener diode and to determine its breakdown (Zener) voltage.

Total Hours: 30

TEXTBOOKS:

1.	Ajoy Ghatak, Optic, McGraw Hill Education India Pvt. Ltd., New Delhi, 7 th Edition, 2024.
2.	Arthur Beiser, Concepts of Modern Physics, McGraw Hill Education, New York, 7 th Edition 2015.
3.	Bernard L. Cohen, Concepts of Nuclear Physic, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 1971.
4.	David J. Griffiths and Darrell F. Schroeter, Introduction to Quantum Mechanics, 3 rd Edition, Cambridge University Press, Cambridge, 2018.
5	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 12 th Edition, Pearson Education, London, 2023.

REFERENCE BOOKS:

1.	Bahaa E. A. Saleh and Malvin Carl Teich., Fundamentals of Photonics, John Wiley & Sons, Hoboken, 3 rd Edition, 2019.
2.	Kenneth S. Krane, Modern Physics, John Wiley & Sons, New York, 3 rd Edition, 2012.

3.	Stephen Gasiorowicz, Quantum Physics. John Wiley & Sons, Hoboken, 3 rd Edition 2003.
4.	Thomas L. Floyd, Digital Fundamentals, Pearson Education Limited, Harlow, 11 th Edition 2015.

WEB REFERENCES:

1.	https://www.rp-photonics.com/optics.html
2.	https://openstax.org/books/university-physics-volume-3/pages/8-introduction
3.	https://www.iaea.org/topics
4.	https://ocw.mit.edu/courses/8-04-quantum-physics-i-spring-2016/
5.	https://www.allaboutcircuits.com/textbook/

S. M. S.

K. V. S.
BoS Chairman

U25MA11T	Mathematics - II	L	T	P	C	Total
		3	1	0	4	60

COURSE OBJECTIVES:

• To understand the fundamentals of number systems and basic arithmetic operations
• To apply the concepts of roots and averages in quantitative problem-solving.
• To develop knowledge of surds, indices, and their applications
• To analyze partnership and interest calculation problems
• To apply logarithms and mensuration concepts to practical problems

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Understand the fundamentals of number systems and basic arithmetic operations.
CO2 :	Apply concepts of roots and averages to solve quantitative problems.
CO3 :	Demonstrate knowledge of surds, indices, and their mathematical applications.
CO4 :	Analyze and solve problems involving partnership and interest calculations.
CO5 :	Apply logarithms and mensuration formulas to solve practical and geometric problems.

UNIT I : NUMBER SYSTEM AND BASIC ARITHMETIC	12 Hrs.
Numbers System: Natural Numbers, Integers, Real Numbers, Prime Numbers, Factors and Multiples- Divisibility rule – HCF and LCM of numbers: Methods of finding LCM & GCD- Relationship between LCM & GCD- Applications of LCM & HCF – Decimal fractions: Conversion of fractional into decimal, recurring and terminal decimal- Application – Simplification: Fundamental Operations, Decimal Simplification, Brackets and Nested operations.	

UNIT II : ROOTS, AVERAGES AND APPLICATIONS OF NUMBERS	12 Hrs.
Square roots and cube roots: Definition & properties, Perfect Squares, Factorization method, Division method, Applications – Cube Roots: Definition and Properties, Perfect Cubes, Cube Root by Prime	

Factorization, Cube Root by Estimation, Applications – **Average:** Meaning of Average, Arithmetic Mean, Average of Consecutive Numbers, Weighted Average, Combined Average, Applications and Word Problems.

UNIT III : SURDS, INDICES AND APPLICATIONS

12 Hrs.

Surds: Definition, Types of Surds, Similar and Dissimilar Surds, Simplification of Surds, Rationalization of Denominators, Operations on Surds – **Indices:** Laws of Indices, Positive and Negative Indices, Fractional Indices, Scientific Notation, Applications.

UNIT IV : PARTNERSHIP AND INTEREST CALCULATIONS

12 Hrs.

Partnership: Simple Partnership, Working Partnership, Sleeping Partnership, Profit Sharing, Applications – **Simple Interest:** Principal, Rate and Time, Formula for Simple Interest, Amount Calculation, Finding Principal, Rate and Time, Applications – **Compound Interest:** Compound Interest Formula, Annual Compounding, Half-Yearly Compounding, Quarterly Compounding.

UNIT V : LOGARITHMS AND MENSURATION

12 Hrs.

Logarithms: Definition of Logarithm, Common and Natural Logarithms, Laws of Logarithms, Change of Base Formula. **Area:** Square, Rectangle, Triangle, Parallelogram, Circle, Composite Figures – **Surface Area and Volume:** Cube, Cuboid, Cylinder, Cone, Sphere, Hemisphere.

Total Hours: 60

TEXT BOOKS :

1. Aggarwal. R. S, “Quantitative Aptitude for Competitive Examinations”, S. Chand Publishing, 2023.
2. Abhijit Guha, “Quantitative Aptitude for Competitive examinations”, 4 th edition – Tata MH, 2011.

REFERENCE BOOKS :

1. Rajesh Verma, “Fast Track Objective Arithmetic”, Arihant Publications, 2024.
2. Tyra. M, “Magical Book on Quicker Maths”, BSC Publishing Co. Pvt. Ltd., 2018.
3. Sarvesh K. Verma, “Quantitative Aptitude Quantum CAT”, Arihant Publications, 2026.

4.	Gupta. S. K and Vinod Kumar, “College Mathematics”, Pragati Prakashan , 2011.
5.	Serge Lang, “Basic Mathematics”, Springer, 1998.

WEB REFERENCES :

1.	https://nhck.in/wp-content/uploads/2020/06/qmb-1-UNIT-1.pdf
2.	https://ugcmoocs.inflibnet.ac.in/assets/uploads/1/10/252/et/P05_M23200217111102025151.pdf
3.	https://www.youtube.com/watch?v=4YvKeItLI4
4.	https://edscl.in/pluginfile.php/2742/mod_resource/content/1/simple%20and%20compound%20interest.pdf
5.	https://www.vedantu.com/maths/logarithms

Shankar

K. V. S.

BoS Chairman

U25CS66T	Fundamentals of Python	L	T	P	C	Total
		2	0	0	2	30

COURSE OBJECTIVES:

• To understand the fundamentals of Python programming language
• To learn Python syntax, variables, data types, and operators
• To develop programs using conditional statements
• To implement looping statements and perform operations on arrays
• To create modular programs using functions and recursion

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Explain the fundamentals of Python programming, including its history, features, identifiers, keywords, variables, data types, input/output statements, comments, and indentation.
CO2 :	Apply various Python operators such as arithmetic, relational, logical, assignment, bitwise, conditional operators, and operator precedence while solving programming problems.
CO3 :	Develop Python programs using decision-making constructs such as if, if-else, nested if, and if-elif-else statements.
CO4 :	Construct Python programs using looping statements, jump statements, and arrays to solve computational problems.
CO5 :	Design modular Python programs using user-defined functions, different types of function arguments, return statements, and recursion.

UNIT I : Basics of Python Programming	6 Hrs.
History of Python - Getting Started with Python - Features of Python – Constants – Variables – Identifiers – Keywords - Built-in Data Types - Output Statements - Input Statements – Comments - Indentation.	

UNIT II : Operators	6 Hrs.
Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Bitwise Operators - Conditional Operators - Operator Precedence.	

UNIT III : Conditional Statements	6 Hrs.
If statement - if-else statement - nested if statement - if-elif-else statement.	

UNIT IV : Looping Statements and Arrays	6 Hrs.
while loop - for loop - nested loops - break, continue, pass statements - Defining, Processing Arrays and Array Methods.	

UNIT V - Functions	6 Hrs.
Function Definition - Function Call - Return Statement – Required – Keyword – Default - Variable-Length Arguments - Recursion.	

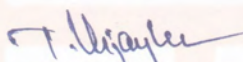
Total Hours: 30

TEXT BOOKS :	
1.	Python Programming: An Introduction to Computer Science, John M. Zelle, Franklin, Beedle & Associates Inc., 3rd Edition, 2017.
2.	Python for Everyone, Cay S. Horstmann & Rance D. Necaise, Wiley, 3rd Edition, 2023.
3.	Python Crash Course, Eric Matthes, No Starch Press, 3rd Edition, 2023.
4.	Learning Python, Mark Lutz, O'Reilly Media, 5th Edition, 2013.
5.	Think Python, Allen B. Downey, O'Reilly Media, 2nd Edition, 2015.

REFERENCE BOOKS :	
1.	Fundamentals of Python Programming, Richard L. Halterman, Southern Adventist University, 1st Edition, 2018.
2.	Introduction to Computation and Programming Using Python, John V. Guttag, MIT Press, 2nd Edition, 2016.
3.	Python Programming: Using Problem Solving Approach, Reema Thareja, Oxford University Press, 2nd Edition, 2019.
4.	Core Python Programming, R. Nageswara Rao, Dreamtech Press, 2nd Edition, 2019.
5.	Beginning Python, Magnus Lie Hetland, Apress, 3rd Edition, 2017.

WEB REFERENCES :

1.	https://www.programiz.com/python-programming
2.	https://docs.python.org/3/tutorial/
3.	https://www.w3schools.com/python/default.asp
4.	https://www.geeksforgeeks.org/python/python-programming-language-tutorial/
5.	https://www.tutorialspoint.com/python/index.htm


BoS Chairman

U25TA05T	Tamizhum Ilakkanamum	L	T	P	C	Total
		2	0	0	2	30

பாடத்திட்டத்தின்நோக்கங்கள்

- தமிழ்மொழி மற்றும் இலக்கணப் பாடத்திட்டத்தின் முதன்மை நோக்கம் மாணவர்களிடம் மொழித்திறனை வளர்ப்பதும் பண்பாட்டு விழுமியங்களை புகுத்துவதாகும்
- ஒருமொழியைப்பிழையின்றிபேசவும்எழுதவும்பழகுதல்
- இலக்கணஅறிவுக்கேற்றார்போல்அம்மொழியின்இலக்கியச்செழுமையை அறியவைத்தல்
- இலக்கணஅறிவுமற்றும்மொழிதாய்மையைஅறிவதோடுஇலக்கியநயத்தையும்அழகிய லையும்அறிதல்
- தமிழ்மொழியின்பண்பாடுமற்றும்வாழ்வியல்விழுமியங்களைமாணவர்கள்தெரிந்துக் கொள்ளுதல்

பாடத்தின்கற்றல்பயன்பாடு (COURSE OUTCOMES):

இப்பாடத்தை நிறைவு செய்யும்போது, மாணவர்களால் பின்வருவனவற்றைச் செய்ய இயலும்

CO1 :	தமிழ்மொழியின்ஜந்திலக்கணத்தின்அறிவைப்பெறுவதால்பிழையின்றிபேசவும்எழுத வும்கற்கின்றான்.
CO2 :	அறஇலக்கியங்களைப்படிப்பதால்வாழ்வியல்நெறிகளைஅறிந்துக்கொள்கிறான்.
CO3 :	தமிழ்அறிஞர்களின்வரலாற்றையும்இலக்கியத்தையும்தெரிந்துக்கொண்டுபடைப்பிலக் கியத்திறனைவளர்த்துக்கொள்கிறான்.
CO4 :	எழுத்துப்பயிற்சிபெறுவதால்பிழையின்றிபேசுவதோடுகருத்துத்தெளிவும்சிந்தனைஅ றிவும்பெற்றுமொழிக்கற்றலைஅடைகின்றான்.
CO5 :	தமிழ்ஊடகங்களைக்கற்பதால்சமூகப்புரிதல் ,மொழிஆளுமைமற்றும்வேலைவாய்ப்பைப்பெறுகிறான்.

அலகு I: ஜந்திலக்கணம்

6 மணிநேரம்

எழுத்திலக்கணம் ,முதலெழுத்து, சார்பெழுத்துஅறிமுகம்-சொல்லிலக்கணம் ,நால்வகைச்சொற்கள்அறிமுகம்-பொருளிலக்கணம் - அகப்பொருள்,புறப்பொருள்அறிமுகம்யாப்பிலக்கணம்அறிமுகம் - அணியிலக்கணம்அறிமுகம்.

அலகு II : அறஇலக்கியம்	6 மணிநேரம்
பதினெண்கீழ்க்கணக்குநூல்கள் அறிமுகம் – அறநூல்கள்- அகநூல்கள், புறநூல்கள்- திருக்குறள்- நட்பு ஆராய்தல்- புறங்கூறாமை அதிகாரங்கள்.	

அலகு III : தமிழ்த்தொண்டாற்றிய தமிழறிஞர்கள்	6 மணிநேரம்
தெ.பொ.மீனாட்சிசுந்தரனார் - உ.வே.சாமிநாதய்யர் - சி.இலக்குவனார் – மறைமலையடிகள் - மு.வரதராசனார் - பிறதமிழறிஞர்கள்.	

அலகு IV: எழுத்துப்பயிற்சி	6 மணிநேரம்
மொழிக்குமுதலில்வரும்எழுத்துக்கள் - மொழிக்குஇறுதியில்வரும்எழுத்துக்கள் - வல்லினம்மிகுமிடங்கள் - மிகாஇடங்கள் - அகரவரிசைப்படுத்திஎழுதுதல் - மரபுப்பிழைகள், பிறமொழிச்சொற்கள், ஒரெழுத்துஒருமொழிஉரியபொருளைக்கண்டறிதல்.	

அலகு V- தமிழ்ஊடகங்கள்	6 மணிநேரம்
செய்தித்தாள் - இதழ்கள்- தினஇதழ்கள் – வாரஇதழ்கள் – பருவஇதழ்கள்தொடர்பானசெய்திகள் - இதழ்களில்கட்டுரைஎழுதும்பயிற்சி.	

மொத்த மணிநேரம்: 30

பாடநூல்கள்:		
1.	முனைவர்மு.அருணாசலம்&இராஜாவரதராஜா., அருண்பதிப்பகம், கண்டோன்மென்ட், திருச்சி, 2017.	தமிழ்இலக்கியவரலாறு,
2.	இரா.இளங்குமரன்., இலக்கணவரலாறு, மணிவாசகர்பதிப்பகம், சென்னை, 2020.	
3.	எம்.ஏ. நுஃமான்., அடிப்படைத்தமிழ்இலக்கணம், புத்தாந்தம், 2007.	அடையாளம்பதிப்பகம்,
4.	தமிழண்ணல்., புதியநோக்கில்தமிழ்இலக்கியவரலாறு, மீனாட்சிபுத்தகநிலையம், மதுரை, 1960.	
5.	கி.இராசா., மக்கள்தகவல்தொடர்பியல், பாவைபதிப்பகம், சென்னை, 2022.	

பார்வைநூல்கள்:

1.	தேவி. இராசேந்திரன் (தேவிரா),தமிழ்இலக்கணம், நந்தினிபதிப்பகம், அண்ணாநகர், சென்னை,2012.
2.	மு.இராமசாமி, கு.முருகேசன், பெ.கோவிந்தசாமி (பதி.ஆசி), இருபதாம்நூற்றாண்டுத்தமிழ்நாடகங்கள், உலகத்தமிழராய்ச்சிநிறுவனம், சென்னை,1999.
3.	முனைவர். இரா.தண்டாயுதம்., தற்காலத்தமிழ்இலக்கியம்., பாரிநிலையம், சென்னை,1985.
4.	முனைவர். துரை. இராஜாராம்., உரைநடைத்தமிழில்சங்கஇலக்கியம் – எட்டுத்தொகை, நர்மதாபதிப்பகம், சென்னை,2018.
5.	தமிழ்ச்சிற்றிலக்கியங்கள்., இரா.சந்திரசேகரன்,கௌராபதிப்பகம், சென்னை,2012.

இணையம்:

1.	https://www.tamilvu.org/courses/diploma/c021/c0211/html/c0211114.htm
2.	https://nandhinigunasekaran.blogspot.com/2016/01/blog-post_10.html
3.	https://shorturl.at/AC3yg
4.	https://shorturl.at/4XVyL
5.	https://kumaritamil.blogspot.com/2024/02/blog-post.html



U 25FR02T	French-II	L	T	P	C	Total
		2	0	0	2	30

COURSE OBJECTIVES:

• Développer les compétences en communication par l'étude de situations familiales, domestiques et de la vie quotidienne en français
• Initier les apprenants aux formes verbales avancées et à leur utilisation pratique dans les conversations
• Améliorer la capacité des élèves à décrire des personnes, des lieux, des routines et des événements en français
• Offrir des exercices de compréhension et de construction de dialogues liés à des situations quotidiennes
• Développer une maîtrise de l'utilisation du présent, du passé récent et du futur proche pour une communication efficace

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Introduction (Verbe, commencer - passer, composé)
CO2 :	Introduction (M. Vincent) La Famille Vincent
CO3 :	Introduction (Mr. Vincent) La Famille Vincent
CO4 :	Détails de famille Vincent
CO5 :	Usage avancé des temps er, re, ir Conjugaison: en 3 groupes

UNIT I :La famille Vincent	6 Hrs.
Leçon No.16 La famille Vincent (suite) Conversation, Exercice also - Page. 45 Le verbe mettre, prendre	

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UNIT III : Les chambres, la salle de bain	6 Hrs.
Les chambres, la salle de bain Introduce verbe aller, Verbe Venir. Conversations and Exercises given	
UNIT II : Le salon, la sale à manger, La cuisine	6 Hrs.
Le salon, la sale à manger, La cuisine Leçon No.17, Page No.46 Exercice given, Page 47 Conversation also.	
UNIT IV : Conjuguez les irregular verbs	6 Hrs.
Le repas, Verbe: boire, Verbe sortir Conversation, Exercise given	
UNIT V: Future, future proche, Passé recent	6 Hrs.
Future Unegrandenouvelle Conversations and Exercices to give Passé recent, future proche.	

Total Hours: 30

TEXT BOOKS :	
1.	G. Mauger, <i>Cours de Langue et de Civilisation Françaises – Livre I</i> , Hachette.
2.	G. Mauger, <i>Cahier d'Exercices – Cours de Langue et de Civilisation Françaises</i> , Hachette.
3.	Ross Steele, <i>Civilisation Progressive du Français – Débutant</i> , CLE International.
4.	Maïa Grégoire, <i>Grammaire Progressive du Français – Débutant</i> , CLE International.
5.	Claire Miquel, <i>Vocabulaire Progressif du Français – Niveau Débutant</i> , CLE International.

REFERENCE BOOKS:

- | | |
|----|---|
| 1. | Livre G. Mauger — Cours de langue et de civilisation française. 1953 |
| 2. | G. Mauger, <i>Cours de Langue et de Civilisation Française</i> . 1954 |
| 3. | Larousse, <i>Dictionnaire Français–Anglais / Anglais–Français</i> . 2023 |
| 4. | H. Compté, <i>French Grammar Made Easy</i> . Oxford University Press, 1999 |
| 5. | Monique L'Huillier, <i>Advanced French Grammar</i> . Cambridge University Press, 1999 |

WEB REFERENCES:

- | | |
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| 1. | https://apprendre.tv5monde.com/ |
| 2. | https://www.bonjourdefrance.com/ |
| 3. | https://www.lepointdufle.net/ |

BoS Chairman

26/8

KV-2

U25EN07T	Functional English	L	T	P	C	Total
		1	0	2	2	45

COURSE OBJECTIVES:

• To use basic grammar and tenses for daily communication
• To build and apply new vocabulary effectively
• To engage in practical spoken interactions and presentations
• To write clear, short notes, messages, and descriptions
• To understand and navigate information in public and daily settings

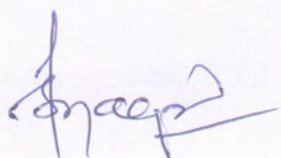
COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Communicate accurately in everyday spoken and written contexts.
CO2 :	Express ideas more precisely using an expanded vocabulary.
CO3 :	Handle common real-life conversations confidently.
CO4 :	Produce functional written pieces for practical needs.
CO5 :	Interpret and act on information in public and routine situations.

UNIT I : ESSENTIAL GRAMMAR	9 Hrs.
Parts of Speech (Noun, Verb, Adjective, Adverb), Subject-predicate; Basic Question Formation: Yes/No questions, Wh-questions; Practical application in describing routines, ongoing actions, past events, and future plans; Common errors in writing and speaking.	

UNIT II : LEXICAL SKILLS	9 Hrs.
Learning Vocabulary /Acquiring Vocabulary: Active & Passive Vocabulary, Reading & Speaking Vocabulary; Word Building (Affixation and Compounding); Content Words and Function Words; Types of Vocabulary: Jargons, Technical Vocabulary, Academic Vocabulary (AWC); Vocabulary for Daily Life.	



UNIT III: FUNCTIONAL ASPECTS OF SPEAKING SKILLS	9 Hrs.
Greetings, Self-introduction, Making requests, Asking for permission; Expressing opinions, Agreeing/disagreeing politely; Group Discussions (GD): Purpose and importance; Strategies for effective participation (initiating, expressing, interrupting, agreeing, disagreeing, concluding); Short Presentations/Show & Tell: Describing an object, a place, or a simple process using visual aids.	

UNIT IV: FUNCTIONAL WRITING FOR PRACTICAL PURPOSES	9 Hrs.
Personal Notes and Messages: Writing short notes, leaving phone messages, informal emails/texts; Simple Descriptions: Describing people, places, and objects, Describing a simple event or experience; Vocabulary Building for Writing: Synonyms, antonyms, common collocations.	

UNIT V: NAVIGATING INFORMATION AND PUBLIC SPACES	9 Hrs.
Describing Work and Daily Routines: Talking about one's job, responsibilities; Role-playing Common Scenarios (at the doctor's office, at the bank, at a restaurant, asking for tourist information etc.); Interpreting information from public address systems (public meetings, interviews, train stations, airports, Signs, Notices).	

Total Hours: 45

TEXT BOOKS :	
1.	Syal, Pushpinder and D.V Jindal. An Introduction to Linguistics: Language, Grammar and Semantics. 2nd Ed. Delhi: PHI learning private Limited, 2016.
2.	Lightbown, Patsy and Nina Spada. How Languages are Learned. 4th Ed. Oxford: Oxford University Press, 2000.
3.	Robinson, Sarah. "A Context Driven Approach To Teaching Accademic Vocabulary." North Dakota: University of North Dakota, 2012. 1-46.
4.	Carnegie, Dale. The Art of Public Speaking. Random House, 2010.
5.	Sasikumar, V., P. Kiranmai Dutt, and Geetha Rajeevan. A Course in Listening and Speaking I. Cambridge University Press, 2007.

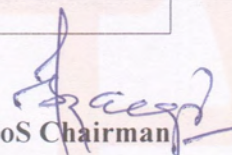
REFERENCE BOOKS :	
1.	Fisher, D., & Frey, N. (2010). Unpacking the Language Purpose: Vocabulary, Structure, and Function. TESOL Journal, 315-337.
2.	Spada, N. (2007). Communicative Language Teaching. In J. Cummins & C. Davison (Eds.), International Handbook of English Language Teaching (pp. 271–288). Springer US.

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| 3. | Oliveira, L. C. D. (2015). A systemic-functional analysis of English language learners' writing. DELTA: Documentação de Estudos em Linguística Teórica e Aplicada, 31(1), 207-237. |
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| 2. | https://www.oxfordlearnersdictionaries.com/ |
| 3. | https://www.bbc.co.uk/learningenglish |
| 4. | https://www.cambridgeenglish.org/learning-english |
| 5. | https://www.bbc.co.uk/learningenglish/english/features/english-at-work?utm_source=chatgpt.com |


BoS Chairman

U25CH03T	Synthetic Chemistry Laboratory Techniques	L	T	P	C	Hrs
		1	0	2	2	45

COURSE OBJECTIVES:

• To familiarize and handle the glass wares
• To understand the separation and purification techniques
• To demonstrate the various chromatographic techniques
• To learn the basic instruments and characterization techniques
• To analyze the concepts in organic synthesis, various purification and characterization techniques

COURSE OUTCOMES:

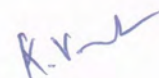
After completion of the course, the students will be able to

CO1 :	Able to understand the basic glassware and handling methods
CO2 :	Understand the various separation techniques
CO3 :	Demonstrate the purification methods using chromatography techniques
CO4 :	Know the analytical techniques
CO5 :	Analyze the basic concepts in organic synthesis

UNIT I :GENERAL TECHNIQUES	9 Hrs.
Handling glassware, and equipment (furnace, oven), transferring methods, heating and cooling methods, filtration process.	

UNIT II :SEPARATION TECHNIQUES	9 Hrs.
Introduction to Rotary evaporation, distillation and different distillation process, distillation-set up and liquid-liquid extraction.	

UNIT III:PURIFICATION METHODS	9 Hrs.
Introduction to Chromatography, principles of chromatography –different types of Chromatography, Thin Layer Chromatography–Column Chromatography– crystallization methods.	

UNIT IV:ANALYTICAL TECHNIQUES**9 Hrs.**

Introduction and basic principles of UV-Visible Spectrometry (demo), NMR and mass spectroscopy (Analysis of the spectrum to confirm the structure assignment).

UNIT V:Organic Synthesis**9 Hrs.**

Introduction to organic synthesis, Single step synthesis (involves preparation, reaction set-up, monitoring the progress, work-up, purification and introduction to various characterization techniques).

TEXTBOOKS:

- | | |
|----|--|
| 1. | 1. R. Gopalan, P.S.Subramanian, K.Rangarajan , Analytical Chemistry, New age, Sultan Chand & Sons Publishing Year: third edition 2003. |
| 2. | Douglas A. Skoog and D.M.West, Principles of Instrumental Analysis, W.B. Saunders, New York, 1982. |
| 3. | Vogel's Text book of quantitative chemical analysis-5 th edition. |
| 4 | F.G. Mann, B.C Saunders, Practical Organic Chemistry, 4th Edn., Pearson Education India, 2009. |

REFERENCE BOOKS:

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| 1 | Rober H. Hill, David C. Finster, Laboratory Safety for Chemistry Students 2Ed. John Wiley and Sons U.S.A. 2016 |
| 2 | Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., New Delhi, Vishal Publishing Co.,2016. |
| 3 | D.A. Skoog, D.M. West, F.J. Holler, S.R. Crouch, Fundamentals of Analytical Chemistry, 8thEdn., Saunders College Pub., 2007. |
| 4 | Nad, A.K., Mahapatra, B., Ghoshal, A., An Advanced Course in Practical Chemistry, NewCentral Book Agency (P) Ltd., Kolkata, India, 2022. |

WEB RESOURCES

- | | |
|----|---|
| 1. | https://nptel.ac.in/courses/103105060 |
| 2. | https://mlsu.ac.in/econtents/405_Unit%20-%20Different%20Chromatogrpahy%20techniques.pdf |
| 3. | https://nptel.ac.in/courses/103107156 |

U25VA03B	Health Wellness and Yoga Education	L	T	P	C	Total
		1	0	2	2	45

COURSE OBJECTIVES:

• To introduce the knowledge systems of Indian traditional medicine and holistic healthcare practices
• To develop understanding of the fundamental principles of Ayurveda and their application to health and wellness
• To promote preventive healthcare through Ayurvedic lifestyle practices and healthy living
• To familiarize students with the philosophy, traditions, and classical texts of Yoga
• To cultivate ethical values, self-discipline, holistic personality development, and well-being through Yoga

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Understand the knowledge framework, evolution, and significance of Indian Medical Systems.
CO2 :	Explain the basic principles of Ayurveda, including Tridosha, Dhatus, Malas, and holistic health concepts.
CO3 :	Apply Ayurvedic lifestyle practices such as Dinacharya, Ritucharya, and wellness principles for preventive healthcare.
CO4 :	Describe the philosophical foundations, classical texts, and traditions of Yoga.
CO5 :	Practice Yogic values, Ashtanga Yoga, and ethical principles for personal growth and social well-being.

UNIT I : KNOWLEDGE FRAMEWORK OF INDIAN MEDICAL SYSTEMS	9Hrs.
Indian Medical Systems: Ayurveda – Unani – Siddha – Sowa Rigpa – Codified and non-codified medical knowledge in India – Historical development of Ayurveda – Classical Ayurvedic literature – Panchamahabhuta Siddhanta (Five Element Theory) and its significance in health and healing.	

UNIT II : FUNDAMENTAL CONCEPTS OF AYURVEDA	9 Hrs.
Introduction to Ayurveda: Ashtanga Ayurveda (Eight therapeutic specialties) – Tridosha Theory: Vata – Pitta and Kapha – Sapta Dhatus (Seven body tissues) – Malas (Excretory functions) and their role in maintaining health and well-being.	

UNIT III : AYURVEDIC LIFESTYLE AND WELLNESS PRACTICES	9 Hrs.
Prakriti: Body - mind constitution and healthcare implications – Trigunas: Sattva – Rajas – Tamas – Agni: Digestion and metabolism – Dinacharya (Daily regimen) – Ritucharya (Seasonal regimen) – Role of Ayurveda in wellness promotion and disease prevention.	

UNIT IV : FOUNDATIONS OF YOGA AND YOGIC PHILOSOPHY	9 Hrs.
Yoga : Definition – Importance of Yoga – Laukik and Adhyatmik benefits of Yoga – Myths and facts of Yoga – Hiranyagarbha as the Mula Pravakta of Yoga – Bharatiya Yoga Darshana: Patanjali Yoga Sutras and Vyasa Bhashya – Sankhya Darshana as the theoretical foundation of Yoga – Yoga in Bhagavad Gita and Upanishads (Katha and Svetashvatara) – Puranic Yoga (Kapila) – Jaina and Bauddha Yoga traditions – Introduction to Tantra, Mantra, Laya, and Kundalini Yoga.	

UNIT V : ASHTANGA YOGA, YOGA CULTURE AND VALUE EDUCATION	9 Hrs.
Ashtanga Yoga according to Patanjali Yoga Sutras: Yama – Niyama – Asana – Pranayama – Pratyahara – Dharana – Dhyana – Samadhi – Importance and practice of Dinacharya – Yoga culture and values – Paths of Yoga: Jnana – Bhakti – Karma – Raja Yoga – Daivi – Asuri Gunas (Bhagavad Gita, Chapter 16) – Principles of Jnana Yoga: Viveka – Vairagya – Shat Sampatti – Mumukshutva.	

Total Hours: 45 Hours

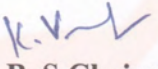
TEXT BOOKS :	
1.	Vasant C. Patil, Principles and Practice of Ayurveda, Chaukhamba Sanskrit Pratishthan, New Delhi, Latest Edition.
2.	Robert E. Svoboda, <i>Prakriti: Your Ayurvedic Constitution</i> , Lotus Press, Wisconsin, Latest Edition.
3.	B. K. S. Iyengar, <i>Light on Yoga</i> , HarperCollins Publishers, New Delhi, Latest Edition.
4.	Swami Vivekananda, <i>Raja Yoga</i> , Advaita Ashrama, Kolkata, Latest Edition.
5.	Ministry of AYUSH, <i>Yoga for Wellness</i> , Ministry of AYUSH, Government of India, New Delhi, Latest Edition.

REFERENCE BOOKS :	
1.	Vagbhatta, <i>Ashtanga Hridayam</i> (Translated by K. R. Srikantha Murthy), Chaukhambha Krishnadas Academy, Varanasi, Latest Edition.
2.	Sushruta, <i>Sushruta Samhita</i> (Translated by P. V. Sharma), Chaukhambha Vishvabharati, Varanasi, Latest Edition.

3.	Patanjali, The Yoga Sutras of Patanjali (Translated by Swami Vivekananda), Advaita Ashrama, Kolkata, Latest Edition.
4.	David Frawley, Ayurveda and the Mind: The Healing of Consciousness, Lotus Press, Wisconsin, Latest Edition.
5.	Swami Satyananda Saraswati, Asana Pranayama Mudra Bandha, Yoga Publications Trust, Munger, Latest Edition.

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BoS Chairman