



TAKSHASHILA UNIVERSITY

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

FACULTY OF SCIENCES
SCHOOL OF BASIC SCIENCES

Department of Mathematics

REGULATION 2025 NEP
CURRICULUM & SYLLABI
B.Sc-MATHEMATICS
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 become a globally recognized center of excellence in teaching, pure mathematics, and applied research.

To equip individuals with the analytical and quantitative reasoning skills needed to solve complex, real-world scientific and industrial challenges.

To build a diverse, inclusive community where learners appreciate the elegance of mathematical sciences and become confident users of quantitative data.

MISSION :

M1: Quality Education	To provide rigorous, updated academic programs that train competent, analytically sound mathematicians, educators, and engineers.
M2: Research, Innovation, and Interdisciplinary Collaboration	To foster an environment that supports groundbreaking interdisciplinary research and the continuous development of mathematical theory.
M3: Professional Competency, Ethics, and Leadership	To develop skilled, ethical, and socially responsible science professionals by organizing conferences, workshops, and events that align with current societal requirements and practical engagement.
M4: Industry Engagement and Sustainable Development	To nurture logical reasoning, creativity, and persistent problem-solving habits that transfer beyond the classroom into lifelong learning and productive citizenship.

PROGRAMME OUTCOMES

PO1: Disciplinary Knowledge:

Demonstrate comprehensive understanding of core concepts, theories, and methodologies relevant to the maths discipline.

PO2: Analytical and Critical Thinking:

Formulate logical conclusions, evaluate evidence objectively, and use critical thinking to solve complex, real-world problems.

PO3: Problem Solving:

Identify, analyze, and devise data-driven solutions while considering societal and environmental impacts.

PO4: Effective Communication:

Articulate complex ideas clearly, prepare coherent reports, and make impactful presentations to diverse audiences.

PO5: Modern Tool Usage:

Select and apply modern IT tools, laboratory equipment, and predictive modeling techniques relevant to research and industry.

PO6: Ethics and Values:

Commit to professional ethics, environmental sustainability, and their responsibilities as informed citizens.

PO7: Teamwork and Leadership:

Function effectively as an individual and as a member or leader in multidisciplinary teams.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Professional Knowledge

Graduates will acquire a comprehensive understanding of fundamental mathematical concepts, abstract principles, and logical reasoning. They will be able to translate real-world situations into mathematical frameworks and use quantitative skills to analyze information and draw accurate conclusions.

PEO2: Research and Development

Graduates will develop the ability to formulate and solve complex problems. They will effectively design mathematical models for scientific, engineering, and socio-economic contexts, integrating modern computational and software tools to process data and evaluate optimal solutions.

PEO3: Leadership

Graduates will build a robust theoretical foundation—such as in algebra, analysis, and calculus—that enables them to pursue postgraduate studies (e.g., M.Sc., Ph.D.). They will be prepared to undertake academic research, fostering the creation of new techniques and methods in mathematical sciences.

PEO4: Professional Competence and Lifelong Learning

Graduates will possess the communication and teamwork skills necessary to collaborate across multidisciplinary settings. They will engage in lifelong learning, adapting to technological advancements and finding successful employment in sectors like banking, finance, data analytics, and education.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Domain Knowledge

Students develop an in-depth understanding of core mathematical domains, including algebra, calculus, differential equations, and real/complex analysis, preparing them for advanced research.

PSO2: Analytical and Critical thinking

Graduates acquire the ability to construct rigorous logical proofs, analyze complex theoretical problems, and synthesize quantitative information to evaluate solutions critically.

PSO3: Practical problem solving

Students learn to translate real-world phenomena into mathematical frameworks, utilizing quantitative models to solve practical issues in science, business, and technology



**TAKSHASHILA
UNIVERSITY**

(Established under Tamil Nadu State Private Universities Act 2019 &
Recognized by UGC u/s 2(f) of the UGC Act, 1956)

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FACULTY OF SCIENCES
DEPARTMENT OF MATHEMATICS (B.Sc. MATHEMATICS)
(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	U25MA19T	Calculus	DSC	3	1	0	4	60	20	5	5	5	5	-	40	60	100
2	U25CH02B	General Chemistry – II	DSC	3	0	2	4	75	20	5	5	5	5	50	40	60	150
3	U25PH04B	Physics – II	IDC	3	0	2	4	75	20	5	5	5	5	50	40	60	150
4	U25CS66T	Fundamentals of Python	MDC	1	0	2	2	45	-	-	-	-	-	-	100	-	100
Total:							14	255									
5	U25TA05T	Tamizhum Ilakkanamum	AEC	2	0	0	2	30	20	5	5	5	5	-	40	60	100
6	U25EN07T	Functional English	AEC	1	0	2	2	45	20	5	5	5	5	-	40	60	100
7	U25CH03T	Synthetic Chemistry Laboratory Techniques	SEC	1	0	2	2	45	-	-	-	-	-	-	100	-	100
8	U25VA02B	Health Wellness and Yoga Education	VAC	1	0	2	2	45	-	-	-	-	-	-	100	-	100
Total:							8	165									
Total:							22	420						100	500	300	900

Note:

L – Lecture

P – Practical

ASS – Assignment

CAM – Continuous Assessment Marks

ESM – End Semester Exam Marks

T – Tutorial

CAT – Continuous Assessment Test

ATT – Attendance

SEM – Seminar

K. V. S.
BoS Chairman

U25MA19T	Calculus	L	T	P	C	Total
		3	1	0	4	60

COURSE OBJECTIVES:

To understand the fundamental concepts of differential and integral calculus and apply them to solve mathematical problems
To develop proficiency in higher-order differentiation, Jacobians, total differentials, and optimization techniques for functions of two and three variables
To analyze curves in Cartesian and polar coordinates by studying tangents, curvature, radius of curvature, centres of curvature, evolutes, envelopes, and asymptotes
To acquire knowledge of reduction formulas, Beta and Gamma functions, and the properties of definite integrals for evaluating integrals efficiently
To apply double and triple integrals to compute areas, surface areas, and volumes arising in mathematical, scientific, and engineering applications

COURSE OUTCOMES:

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

CO1 :	Determine the extreme values of functions and apply optimization techniques to solve real-life engineering, economic, and scientific problems.
CO2 :	Apply Cartesian and polar coordinate systems to model and analyze real-world geometric and physical phenomena.
CO3 :	Analyze curvature, evolutes, envelopes, and asymptotes for applications in engineering design, transportation, and robotics.
CO4 :	Solve integral calculus problems using reduction formulas, Beta and Gamma functions, and apply them to scientific and engineering contexts.
CO5 :	Evaluate double and triple integrals to compute areas, surface areas, and volumes in engineering, architecture, and physical sciences.

UNIT I : DIFFERENTIAL CALCULUS	12 Hrs.
nth derivative - Leibnitz's theorem (Without proof) and its application - Jacobians - Total differential - Maxima and Minima functions of two and three independent variables - Lagrange's method (without proof) - Simple problems.	

UNIT II : DIFFERENTIAL CALCULUS (CONTD...)	12 Hrs.
Polar coordinates – Relation between Cartesian and Polar coordinates - Polar Equation of a Straight line, Circle and Conic only (Related problems not necessary) - Angle between radius vector and tangent – Angle between two curves – Curvature - Radius of Curvature in Cartesian and Polar coordinates.	

UNIT III: DIFFERENTIAL CALCULUS (CONTD...)	12 Hrs.
Centre of Curvature – Evolutes – Envelopes – Asymptotes – General method of finding asymptotes (First Section - Rational algebraic curves only).	

UNIT IV: INTEGRAL CALCULUS	12 Hrs.
Reduction formula for $\sin^n x$, $\cos^n x$, $\tan^n x$, $\sin^m x \cos^n x$ - Beta and Gamma Functions - Properties and Problems – Definite Integral – Properties - Simple Problems.	

UNIT V: INTEGRAL CALCULUS (CONTD...)	12 Hrs.
Double Integrals - Change of order of Integration - Triple Integrals - Applications to Area, Surface Area and Volume.	

Total hours: 60

TEXT BOOKS:	
1.	S.Narayanan and T.K.Manicavachagom Pillay (2004) <i>Calculus</i> . S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.
2.	B. S. Grewal (2022), <i>Higher Engineering Mathematics</i> , Khanna Publishers, New Delhi.
3.	George B. Thomas, Maurice D. Weir and Joel Hass (2018), <i>Calculus</i> , 14th Edition, Pearson Education, New Delhi.
4.	P.R.Vittal. (2004) <i>Calculus</i> , Margham Publication, Chennai.

REFERENCE BOOKS:	
1.	P.Kandasamy, K.Thilagavathy (2004), <i>Mathematic for B.Sc. Vol.-I, II, III & IV</i> , S.Chand & Company Ltd., New Delhi-55.

2.	Shanti Narayan (2001) <i>Differential Calculus</i> . Shyamlal Charitable Trust, New Delhi
3.	Shanti Narayan (2001) <i>Integral Calculus</i> . S.Chand & Co. New Delhi
4.	S.Sudha (1998) <i>Calculus</i> . Emerald Publishers, Chennai.
5.	G.B.Thomas and R.L.Finney. (1998) <i>Calculus and Analytic Geometry</i> , Addison Wesley (9thEdn.), Mass. (Indian Print)

WEB RESOURCES:

1.	https://ocw.mit.edu/search/?q=calculus&utm_source=chatgpt.com
2.	https://www.khanacademy.org/math/calculus-1?utm_source=chatgpt.com
3.	https://openstax.org/subjects/math?utm_source=chatgpt.com
4.	https://www.youtube.com/watch?v=LBZcfl97LwY
5.	https://cpur.in/iqac/naac-documents/other/Consolidate/Double%20Integrals.pdf

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K.V.V.
BoS Chairman

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.
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.	

UNIT V : 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




TEXT BOOKS:

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. Geffery 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

COURSE OUTCOMES:

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.

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. Thickness of a wire - Air Wedge.
2. Newton's ring – Radius of curvature.
3. Spectrometer – grating wavelength of mercury lines.
4. Spectrometer – I – d curve

K.R.

5. Spectrometer – $i - i'$ curve
6. Post office Box – Specific resistance.
7. Construction of AND, OR, NOT gates – using diodes and Transistor.
8. NAND gate as a Universal gate.
9. Zener Diode - Characteristics

Total Hours: 30

TEXT BOOKS :

1.	Ajoy Ghatak, " <i>Optics</i> ", 7th Edition, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2024.
2.	Arthur Beiser, " <i>Concepts of Modern Physics</i> ", 7th Edition, McGraw Hill Education, New York, 2015.
3.	Bernard L. Cohen, " <i>Concepts of Nuclear Physics</i> ", Tata McGraw-Hill Publishing Company Ltd., New Delhi, 1971.
4.	David J. Griffiths and Darrell F. Schroeter, " <i>Introduction to Quantum Mechanics</i> ", 3rd Edition, Cambridge University Press, Cambridge, 2018.

REFERENCE BOOKS:

1.	Bahaa E. A. Saleh and Malvin Carl Teich, " <i>Fundamentals of Photonics</i> ", 3rd Edition, John Wiley & Sons, Hoboken, 2019.
2.	Kenneth S. Krane, " <i>Modern Physics</i> ", 3rd Edition, John Wiley & Sons, New York, 2012.
3.	Stephen Gasiorowicz, " <i>Quantum Physics</i> ", 3rd Edition, John Wiley & Sons, Hoboken, 2003.
4.	Thomas L. Floyd, " <i>Digital Fundamentals</i> ", 11th Edition, Pearson Education Limited, Harlow, 2015
5.	Robert L. Boylestad and Louis Nashelsky, " <i>Electronic Devices and Circuit Theory</i> ", 12th Edition, Pearson Education, London, 2023.

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/

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K.V.
BoS Chairman

U25CS66T	Fundamentals of Python	L	T	P	C	Total
		1	0	2	2	45

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	9 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	9 Hrs.
Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Bitwise Operators - Conditional Operators - Operator Precedence.	

UNIT III : CONDITIONAL STATEMENTS	9 Hrs.
If statement - if-else statement - nested if statement - if-elif-else statement.	

UNIT IV : LOOPING STATEMENTS AND ARRAYS	9 Hrs.
while loop - for loop - nested loops - break, continue, pass statements - Defining, Processing Arrays and Array Methods.	

UNIT V - FUNCTIONS	9 Hrs.
Function Definition - Function Call - Return Statement – Required – Keyword – Default - Variable-Length Arguments - Recursion.	

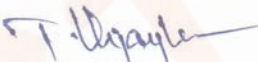
Total Hours: 45

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

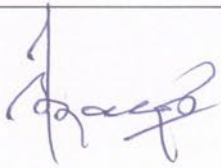
பாடத்திட்டத்தின் நோக்கங்கள்

- தமிழ்மொழி மற்றும் இலக்கணப்பாடத்திட்டத்தின் முதன்மை நோக்கம் மாணவர்களிடம் மொழித்திறனை வளர்ப்பதும் பண்பாட்டு விழுமியங்களை புகுத்துவதாகும்
- ஒரு மொழியைப் பிழையின்றி பேசவும் எழுதவும் பழகுவதல்
- இலக்கண அறிவுக்கேற்றார் போல் அம்மொழியின் இலக்கியச் செழுமையை அறிய வைத்தல்
- இலக்கண அறிவு மற்றும் மொழி தூய்மையை அறிவதோடு இலக்கிய நயத்தையும் அழகியலையும் அறிதல்
- தமிழ் மொழியின் பண்பாடு மற்றும் வாழ்வியல் விழுமியங்களை மாணவர்கள் தெரிந்துக்கொள்ளுதல்

பாடத்தின் கற்றல் பயன்பாடு (COURSE OUTCOMES):

இப்பாடத்தை நிறைவு செய்யும்போது, மாணவர்களால் பின்வருவனவற்றைச் செய்ய இயலும்

CO1 :	தமிழ் மொழியின் ஜந்திலக்கணத்தின் அறிவைப் பெறுவதால் பிழையின்றி பேசவும் எழுதவும் கற்கின்றான்.
CO2 :	அற இலக்கியங்களைப் படிப்பதால் வாழ்வியல் நெறிகளை அறிந்துக்கொள்கிறான்.
CO3 :	தமிழ் அறிஞர்களின் வரலாற்றையும் இலக்கியத்தையும் தெரிந்துக்கொண்டு படைப்பிலக்கியத்திறனை வளர்த்துக்கொள்கிறான்.
CO4 :	எழுத்துப்பயிற்சி பெறுவதால் பிழையின்றி பேசுவதோடு கருத்துத்தெளிவும் சிந்தனை அறிவும் பெற்று மொழிக்கற்றலை அடைகின்றான்.
CO5 :	தமிழ் ஊடகங்களைக் கற்பதால் சமூகப்புரிதல் ,மொழி ஆளுமை மற்றும் வேலை வாய்ப்பைப் பெறுகிறான்.



அலகு I: ஐந்திலக்கணம்	6 மணிநேரம்
எழுத்திலக்கணம் ,முதலெழுத்து, சார்பெழுத்து அறிமுகம்- சொல்லிலக்கணம் ,நால்வகைச் சொற்கள் அறிமுகம்- பொருளிலக்கணம் – அகப்பொருள்,புறப்பொருள் அறிமுகம் யாப்பிலக்கணம் அறிமுகம் - அணியிலக்கணம் அறிமுகம்.	

அலகு II : அற இலக்கியம்	6 மணிநேரம்
பதினெண் கீழ்க்கணக்கு நூல்கள் அறிமுகம் – அற நூல்கள்- அக நூல்கள், புற நூல்கள்- திருக்குறள் - நட்பு ஆராய்தல்- புறங்கூறாமை அதிகாரங்கள்.	

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

அலகு IV: எழுத்துப் பயிற்சி	6 மணிநேரம்
மொழிக்கு முதலில் வரும் எழுத்துக்கள் - மொழிக்கு இறுதியில் வரும் எழுத்துக்கள் - வல்லினம் மிகுமிடங்கள் - மிகா இடங்கள் - அகர வரிசைப்படுத்தி எழுதுதல் - மரபுப் பிழைகள், பிறமொழிச் சொற்கள், ஒரெழுத்து ஒரு மொழி உரிய பொருளைக் கண்டறிதல்.	

அலகு V- தமிழ் ஊடகங்கள்	6 மணிநேரம்
செய்தித்தாள் - இதழ்கள் – தின இதழ்கள் – வார இதழ்கள் – பருவ இதழ்கள் தொடர்பான செய்திகள் - இதழ்களில் கட்டுரை எழுதும் பயிற்சி.	

மொத்த மணிநேரம் : 30

பாடநூல்கள்:	
1.	முனைவர் மு.அருணாசலம் & இராஜா வரதராஜா., தமிழ் இலக்கிய வரலாறு, அருண் பதிப்பகம், கண்டோன்மென்ட், திருச்சி, 2017.
2.	இரா.இளங்குமரன்., இலக்கண வரலாறு,மணிவாசகர் பதிப்பகம்,சென்னை, 2020.

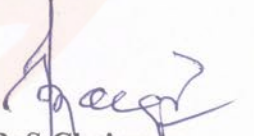
3.	எம்.ஏ. நுஃமான்., அடிப்படைத் தமிழ் இலக்கணம், அடையாளம் பதிப்பகம், புத்தாந்தம்,2007.
4.	தமிழண்ணல்., புதிய நோக்கில் தமிழிலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை, 1960.
5.	கி.இராசா., மக்கள் தகவல் தொடர்பியல், பாவை பதிப்பகம், சென்னை, 2022.

பார்வை நூல்கள்:

1.	தேவி. இராசேந்திரன் (தேவிரா)., தமிழ் இலக்கணம், நந்தினி பதிப்பகம், அண்ணாநகர், சென்னை,2012.
2.	மு.இராமசாமி, கு.முருகேசன், பெ.கோவிந்தசாமி (பதி.ஆசி)., இருபதாம் நூற்றாண்டுத் தமிழ் நாடகங்கள், உலகத் தமிழராய்ச்சி நிறுவனம், சென்னை,1999.
3.	முனைவர். இரா.தண்டாயுதம்., தற்காலத் தமிழ் இலக்கியம்., பாரி நிலையம், சென்னை,1985.
4.	முனைவர். துரை. இராஜாராம்., உரைநடைத் தமிழில் சங்க இலக்கியம் – எட்டுத்தொகை, நர்மதா பதிப்பகம், சென்னை,2018.
5.	தமிழ்ச் சிற்றிலக்கியங்கள்., இரா.சந்திரசேகரன்,கௌரா பதிப்பகம், சென்னை,2012.

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3.	https://shorturl.at/AC3yg
4.	https://shorturl.at/4XVyL
5.	https://kumaritamil.blogspot.com/2024/02/blog-post.html


BoS Chairman

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.	

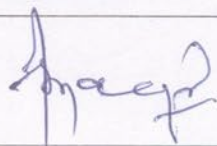
UNIT IV: FUNCTIONAL WRITING FOR PRACTICAL PURPOSES	9 Hrs.
Personal Notes and Messages: Writing short notes, leaving phone messages, informal emails/texts; Simple Descriptions: Describing people, places, and objects, Describing a simple event or experience; Vocabulary Building for Writing: Synonyms, antonyms,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

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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.



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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4.	https://www.cambridgeenglish.org/learning-english
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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 and 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.	

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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:	
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.

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2.	https://www.slideshare.net/slideshow/distillation-211262763/211262763
3.	https://mlsu.ac.in/econtents/405_Unit%204-%20Different%20Chromatogrpahy%20techniques.pdf
4.	https://www.youtube.com/watch?v=zwfDCsrnGKw
5.	https://www2.chemistry.msu.edu/faculty/reusch/virttxtjml/synth2.htm

K.V. 
BoS Chairman

U25VA02B	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	9 Hrs.
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.	

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

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3.	https://www.yogamdnny.nic.in/files/pdf/YogaforMentalHealth.pdf
4.	https://nptel.ac.in/courses/110101165
5.	https://www.ttcn.co.in/Diglib/DELED/S5/unit1YOGA.pdf


BoS Chairman