BHARATHIAR UNIVERSITY

COIMBATORE

A three-year Under-Graduate Programme in

B. Sc. (Blended) Physics

Offered By

Centre for International Affairs (CIA), Bharathiar

University in collaboration with The University of

Melbourne

(For the students admitted during the academic year 2025 – 26 onwards)

Syllabus for SEM I–VI

(To Be Implemented from Academic Year 2025–2026)

Overview of the B.Sc., (Blended) Course

Bharathiar University is offering an innovative Bachelor's Degree known as B.Sc. (Blended) in collaboration with the University of Melbourne (UoM), Australia, to strengthen science education at the undergraduate level.

Bharathiar University is among the top universities in the country and has been at the forefront of initiating innovative programs. The UoM is ranked #1 in Australia and has been among the top 50 universities in the world.

The B.Sc. (Blended) course is a joint initiative of BU-UoM, offering a transparent and internationally recognized bachelor's degree that clearly outlines the teaching objectives and learning outcomes. In the first two years of the degree program, students will study all four basic sciences (Biology, Chemistry, Mathematics, and Physics), and in the third year, they will specialize in either Physics or Chemistry. The UoM will provide support in terms of special lectures, workshops, and quality assurance.

The B.Sc. (Blended) course aims to achieve the following objectives:

- Introduce students to the fundamental concepts of science education.

- Enrich students' knowledge in all basic sciences, including Biology, Chemistry, Mathematics, and Physics.

- Help students develop an interdisciplinary approach to learning that integrates various scientific fields.

- Inculcate a sense of scientific responsibility, social awareness, and environmental consciousness in students.

- Assist students in building a successful and progressive career in academia and industry by providing them with the necessary skills and knowledge.

The B.Sc. (Blended) course will be jointly conducted by Bharathiar University and the University of Melbourne (UoM).

The following features are included in the course:

- Special lectures will be delivered by expert faculty from UoM.

- The course will be quality assured by UoM, ensuring that it meets the highest standards of education.

- Upon completion, the degree will be considered equivalent to a degree from UoM, enabling students to pursue higher studies at UoM or any other Australian university.

- The collaboration with UoM ensures that students receive an internationally recognized education of the highest quality, opening up opportunities for further academic pursuits and careers in various fields. The students will be imparted solid training to enable them to pursue Masters and Integrated Ph.D. degrees in reputed institutes such as IITs, IISERs and Central Universities

Eligibility

Higher Secondary School Certificate (10+2) or its equivalent Examination in Science stream with either PCM group (Physics, Chemistry & Mathematics) or PCMB group (Physics, Chemistry, Mathematics & Biology)

Course Structure

• The B.Sc. (Blended) course follows a semester and credit system that spans over six semesters of 14-16 weeks each. The course curriculum is divided into two phases: the first two years and the third year.

• During the first two years, students will receive instruction in the four basic sciences, namely Biology, Chemistry, Mathematics, and Physics alongside language courses. In the third year, students will specialize in either Physics or Chemistry.

• The curriculum is designed to provide students with a well-rounded education in the sciences, preparing them for further academic pursuits or careers in various scientific fields.

Examination and Grading

- The B.Sc. (Blended) course follows a credit-based system, and its examination process comprises two parts: continuous assessment (internal 50%) and end-semester examination (50%).

- The internal assessment will be based on various parameters, including classroom examinations (subjective/objective), fieldwork, viva-voce, assignments, lab work, tutorials, and group discussions. The grading will be carried out in accordance with the university norms applicable to the credit system.

- This examination process ensures that students are regularly assessed and evaluated based on their academic performance, facilitating a more comprehensive understanding of the subjects and enhancing the overall learning experience. The grading will be as per the university norms applicable to credit system.

University Terms

- The commencement and conclusion dates for the odd and even semesters of the B.Sc. (Blended) course will adhere to the university regulations applicable to other departments.

- To be eligible for the term-end examination, students must fulfill the minimum attendance requirement of 75 percent for both theory and practical courses. Additionally, students must demonstrate satisfactory performance during the term.

- Adherence to these guidelines ensures that students attend classes regularly and maintain consistent academic performance throughout the term. This, in turn, promotes a positive and conducive learning environment for all students.

Intake capacity of student: B.Sc., Blended course:40 (20 for Physics and 20 for Chemistry)

Duration: The duration of **B.Sc., (Blended)** Degree Program shall be of three years.

Medium of Instruction: The medium of instruction for the course shall be English.

Scheme of Examinations (CBCS Pattern)

- Number of weeks in a semester: 14-16

- Nomenclature: BIO: Biology. CHM: Chemistry. MTH: Mathematics PHY: Physics ENG: English; COMP –Computing; IDC: Interdisciplinary Course; FLX: Flexible timetabling

- 1 Credit =1 Contact hour per week both for theory and lab courses

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	**Practical**	**CIA**	**ESE**	**Total**
FIRST SEMESTER							
MTH101	Maths 1: Calculus	4	4	-	50	50	100
PHY101	Physics 1: Introductory Classical Physics	4	4	-	50	50	100
CHM101	Chemistry 1: Introductory and Organic Chemistry	4	4	-	50	50	100
BIO101	Biology 1: The Diversity of Life	4	4	-	50	50	100
PHY102	Physics Practical	2	-	2	25	25	50
CHM102	Chemistry Practical	2	-	2	25	25	50
BIO102	Biology Practical	2	-	2	25	25	50
FLX101* (11T/11H/11M/ 11K)	Part I: Language Paper I- Tamil/Malayalam/French/Hindi/ Kanada	4	4	-	50	50	100
FLX102** (12E)	Part II: English I	4	4	-	50	50	100
1FA#	Value Added 1/Foundation course: Environmental Studies	2	2	-		50	50
Total		32	26	6	375	425	800

*and** indicates the mandatory language papers for all UG students as per the TN state government.
# indicates the UGC mandatory course that all students must opt for. This course will be taught either in online mode or offline mode.

SECOND SEMESTER							
Course Code	Title of the Course	Credits	Theory	Practical	CIA	ESE	Total
MTH201	Maths 2: Algebra	4	4	-	50	50	100
PHY201	Physics 2: Modern Physics	4	4	-	50	50	100
CHM201	Chemistry 2: Inorganic and Physical Chemistry	4	4	-	50	50	100
BIO201	Biology 2: Biology of Cells	4	4	-	50	50	100
PHY202	Physics Practical	2	-	2	25	25	50
CHM202	Chemistry Practical	2	-	2	25	25	50
BIO202	Biology Practical	2	-	2	25	25	50
IDC201	Scientific Computation and Modeling: Introduction to simple models and programming	2		2	25	25	50
FLX201* (21T/21H/21M/21K)	Part I: Language Paper II- Tamil/Malayalam/French/Hindi/Kanada	4	4	-	50	50	100
FLX202** (22E)	Part II: English II	4	4	-	50	50	100
2FB#	Value Added 2/Foundation course: Human Rights	2	2	-		50	50
Total		34	26	8	400	450	850

*and ** indicates the mandatory language papers for all UG students as per the TN state government.
# indicates the UGC mandatory course that all students must opt for. This course will be taught either in online mode or offline mode.

THIRD SEMESTER							
Course Code	Title of the Course	Credits	Theory	Practical	CIA	ESE	Total
MTH301	Maths 3: Vector Calculus, and Differential Equations	4	4	-	50	50	100
PHY301	Physics 3: Quantum mechanics and Thermodynamics	4	4	-	50	50	100
CHM301	Chemistry 3: Reactions and Synthesis	4	4	-	50	50	100
BIO301	Biology 3: Functional Biology of Organisms	4	4	-	50	50	100
PHY302	Physics Practical	2	-	2	25	25	50
CHM302	Chemistry Practical	2	-	2	25	25	50
BIO302	Biology Practical	2	-	2	25	25	50
IDC301	Scientific Computation and Modeling: Projects	2	-	2	25	25	50
FLX301* 31T/31H/31M/31K	Part I: Language Paper III- Tamil/Malayalam/French/Hindi/Kanada	4	4	-	50	50	100
FLX302** (32E)	Part II: English III	4	4	-	50	50	100
3FC#	Value added 3/Foundation course: Yoga for Human Excellence	2	2			50	50
HW	Health & Wellness	1	-	2	25	-	25
	Total	36	26	10	425	450	875

*and ** indicates the mandatory language papers for all UG students as per the TN state government.*

 # indicates the UGC mandatory course that all students must opt for. This course will be taught either in online mode or offline mode.

FOURTH SEMESTER

Course Code	Title of the Course	Credits	Theory	Practical	CIA	ESE	Total
MTH401	Maths 4: Probability and Statistics	4	4	-	50	50	100
PHY401	Physics 4: Electricity, magnetism, Special Relativity and Optics	4	4	-	50	50	100
CHM401	Chemistry 4: Structure and properties	4	4	-	50	50	100
BIO401	Biology 4: Genetics Evolution and Ecology	4	4	-	50	50	100
PHY402	Physics Practical	2	-	2	25	25	50
CHM 402	Chemistry Practical	2	-	2	25	25	50
BIO402	Biology Practical	2	-	2	25	25	50
FLX401* 41T/41H/41M/41K	Part I: Language Paper IV-Tamil/Malayalam/French/Hindi/Kanada	4	4	-	50	50	100
FLX402** (42E)	Part II: English IV	4	4	-	50	50	100
4FD#	Value added 4/Foundation course: General Awareness	2	2			50	50
	Total	32	26	6	375	425	800

*and ** indicates the mandatory language papers for all UG students as per the TN state government.
# indicates the UGC mandatory course that all students must opt for. This course will be taught either in online mode or offline mode.

	FIFTH SEMESTER						
Course Code	**Title of the Course**	**Credits**	**Theory**	**Practical**	**CIA**	**ESE**	**Total**
PHY 501	Classical Mechanics	4	4	-	50	50	100
PHY 502	Quantum Mechanics	4	4	-	50	50	100
PHY 503	Solid State Physics	4	4	-	50	50	100
PHY 504	Electrodynamics	4	4	-	50	50	100
PHY 505	Elective – 1: Introduction to Astrophysics	2	2	-	25	25	50
PHY 506	Elective – 2: Nanotechnology	2	2	-	25	25	50
PHY 507	Physics Lab I	2	-	2	25	25	50
PHY 508	Physics Lab II (analog and digital)	2	-	2	25	25	50
PHY 509	Graduate Level Thesis	2	-	2	25	25	50
	Total	26	20	6	325	325	650

Course Code	Title of the Course	Credits	Theory	Practical	CIA	ESE	Total
	SIXTH SEMESTER						
PHY 601	Statistical Mechanics	4	4	-	50	50	100
PHY 602	Subatomic Physics	4	4	-	50	50	100
PHY 603	Atomic and Molecular Spectroscopy and Lasers	4	4	-	50	50	100
PHY 604	Digital and analog electronics	4	4	-	50	50	100
PHY 605	Elective – 3: Renewable Energy and Energy Harvesting	2	2	-	25	25	50
PHY 606	Elective – 4: Introductory Biophysics	2	2	-	25	25	50
PHY 607	Physics Lab I	2	-	2	25	25	50
PHY 608	Physics Lab II (analog and digital)	2	-	2	25	25	50
PHY 609	Graduate Level Thesis	2	-	2	25	25	50
	Total	26	20	6	325	325	650
	Grand Total	**186**	**144**	**42**	**2225**	**2400**	**4625**

SEMESTER I

Subject Code: MTH101	Maths 1: Calculus	4 Credits

Logic and Proof		
Basic Set Theory		**1 Hour**
Sets, Subsets, Power Sets **Operations:** Union, Intersection, Difference, Complement, Venn Diagrams. **Cardinality:** Finite and Infinite Sets, Countable and Uncountable Sets, Cartesian Products, Indexed Families of Sets		1
Number System		**3 Hours**
Natural Numbers, Integers, Rational Numbers		1
Real numbers		1
Properties of Real Numbers and Completeness Property of Real Numbers		1
Logic		**4 Hours**
Logical Connectives (Conjunction, Disjunction, Negation, Conditional, Biconditional) and Truth Tables		1
Propositional Logic, Logical Equivalence, Logical Laws		1
Quantifiers, Predicate Calculus		1
Negation of Quantified Statements		1
Methods of Proof		**3 Hours**
Direct Proof, Contrapositive		1
Contradiction, Proof by Cases		1
Induction		1
Complex Numbers		
Review of Complex Numbers		**2 Hours**
Definition of Complex Numbers, Algebra of Complex Numbers, Argand Plane, Cartesian and Polar Form		1
Exponential Form: $z = r(cos\ \theta + i\ sin\ \theta)$ Euler's Formula		1
Roots of Complex Numbers		**2 Hours**
Fundamental Theorem of Algebra		1
Finding nth Roots of Unity and De Moivre's Theorem; Roots of Complex Numbers		1
Differential Calculus		
Limits, Continuity and Differentiation		**5 Hours**
Definitions Using ε-δ(limit and continuity), One-sided Limits		1
Limits at Infinity, Continuity and Types of Discontinuities		1
Rules: Product, Quotient, Chain Rule		1
Derivative of Functions (incl. Polynomials, Trigonometric , Exponential, Log Functions)		1
Higher Order Derivatives		1

Inverse Trigonometric Functions and Implicit Differentiation	4 Hours
Inverse Trigonometric Function and Their Derivatives	2
Implicit Differentiation	2

Integral Calculus	
Reimann Integration	1 Hour
Definition of Reimann Integral, Partition, Norm of Partition, Upper and Lower Sums, Conditions for Integrability	1
Fundamental Theorem of Calculus; Review of Standard Antiderivatives	1 Hour
Statement and Explanation of Fundamental Theorem, Relationship Between Differentiation and Integration, Common Antiderivatives (Power, Exponential, Trigonometric and Logarithmic Functions)	1
Techniques of Integration	4 Hours
Derivative Present Substitution, Linear Substitution	1
Integration of Trigonometric Functions Using Identities	1
Integration of Rational Functions Including Partial Fractions, Integration Yielding Inverse Trigonometric Functions	1
Trigonometric Substitutions; Integration By Parts	1
Definite Integral	1 Hour
Definite Integral, Properties and Interpretation of Area, Fundamental Theorem of Calculus Improper Integrals	1
Applications of Integration	2 Hours
Areas Between Curves	1
Volumes of Surfaces of Revolution	1

Ordinary Differential Equations	
Basic Concepts	1 Hour
Definition of ODE, Order, General Solution, Initial Conditions; Separable ODEs	1
First Order ODEs	1 Hour
Separable Equations, Homogeneous and Non-Homogeneous Equations, Linear First-Order Equations (Integrating Factor)	1
Applications of First Order ODEs	3 Hours
Ecology Models	1
Chemical Reaction Rates	1
Newton's Law of Cooling	1
Second Order ODEs	2 Hours
Definitions of Homogeneous/Inhomogeneous, Linear/Non- Linear; Solution of Homogeneous Constant-Coefficient Linear ODEs	1
Particular Solutions Of Inhomogeneous Constant Coefficient Linear ODEs Using Method of Undetermined Coefficients; Principle of Superposition	1

Applications of Second Order ODEs	2 Hours
Springs	1
LRC series electrical circuits	1
Real World Application of ODEs	**3 Hours**
Real World Contextual Examples in Physics and Chemistry and the Application of ODEs (Selection of Examples Depending on Student Cohort)	3

Logics and Proof:
1. Kenneth H. Rosen, Discrete Mathematics and its Applications, 7th Edition, McGraw Hill, 2012.
2. Gary Chartrand, Albert D. Polimeni and Ping Zhang, Mathematical Proofs – A Transition to Advanced Mathematics, 3rd Edition, Pearson Education, Inc., 2012.

Complex Numbers:
1. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 8th Edition, McGraw Hill Higher Education, 2008.
2. L. V. Ahlfors, Complex Analysis, Third Edition, McGraw Hill Book Company, 2013.

Differential Calculus, Integral Calculus and Ordinary Differential Equations:
1. James Stewart, Daniel Clegg and Saleem Watson, Calculus – Early Transcendentals, 9th Edition, Cengage, 2021.
2. Robert A. Adams and Christopher Essex, Calculus – A Complete Course, 7th Edition, Pearson Canada, 2009.
3. Robert T. Smith and Roland B. Minton, Calculus, 4th Edition, McGraw Hill, 2012.
4. Maurice D. Weir, Joel Hass, P. Sivaramakrishna Das and C. Vijaykumari, Calculus, Pearson, 2018.
5. Mukesh Kumar, A.P. Singh and Ashok Kumar, Integral Calculus, Medtech, 2008.
6. S.B. Gaikwad, K.C. Takale, V.S. Jadhav, P.G.Jadhav, S.M. Waingade,S.R. Patil, Calculus, Nirali Prakashan, 2019

Course code	PHY101	Physics 1: Introductory Classical Physics	4 Credits	
Core/Elective/SBS		**CORE PAPER**		
			Syllabus Version	**2023-24**

Unit:1	**Classical Mechanics**	

Straight line motion – Vectors – Two and three dimensional motion – Force and Motion : Newton's Laws – Force and Motion : Drag and Friction – Kinetic energy, work, power – Potential energy, conservation of energy – Collisions and momentum – Rotational motion – Angular momentum-I – Angular momentum-II

Unit:2	**Gravitation**	

Newton's law of gravity – superposition – Gravity at the earth's surface – far above the earth and within the earth – Work and gravitational potential energy - Kepler's laws : the planets and satellites – Orbital motion and energy

Unit:3	**Thermal physics**	

Zeroth Law of Thermodynamics – Thermal expansion and absorption of heat – Heat transfer, conduction, emission, absorption

Unit:4	**Elasticity, fluids and gases**	

Equilibrium and elasticity – Density and Pressure, Pascal's and Archimedes' Principles – Continuity and Bernoulli's Equation – Ideal gases (Kinetic theory of gases) – Mean free path, molecular speed distribution – Specific heat, adiabatic expansion – Real world examples – examples: wind power, hydro, blood circulation, water in plants, materials, osmosis, wind and atmosphere

Unit:5	**ODEs**	

Applications of 2nd order ODEs: Springs – Applications of 2nd order ODEs: LRC series electrical circuits – Real world contextual examples in physics and application of ODEs

	Text Book(s)		
1	Properties of Matter, Brijlal and N.Subrahmanyam,3rd Edition, S. Chand & Co.(2005).
2	Heat & Thermodynamics, Brijlal & N.Subramaniam, S.Chand & Co(2007)
	Reference Books
1	Elements of Properties of Matter, D.S. Mathur, 11th Edition, S. Chand & Co.,(2010).
2	Heat and Thermodynamics–Zemansky and R.H.Dcltanann,TMH (2017)
	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.,]
1	**https://www.physicstutoronline.co.uk/alevelphysicsnotes/**
2	**https://latestcontents.com/bsc-physics-mechanics-notes/**
3	**https://www.askiitians.com/revision-notes/physics/thermodynamics/**
4	**www.khanacademy.org/science/physics/elasticity/surfacetension**

Course Code	CHM101	GENERALCHEMISTRY– CHEMISTRY OF LIFE	4 Credits	
CORE		**Chemistry 1**		
			Syllabus Version	**2023-24**

UNIT I	General Chemistry	

The Periodic Table - The Basis of the Periodic System, Classifications of Elements and Groups – Molecular Structure and Bonding - Chemical Bonding, Types of Chemical Bonds, Bond Characteristics – Acids and Bases - Theories of Acids and Bases, pH of Acids and Bases, Properties of Acids and Bases - Stoichiometry - Stoichiometric Coefficient, Balanced Reactions and Mole Ratios

UNIT II	Organic Chemistry	

Carbon- The Basis of Life – Structure and Bonding Alkanes- Alkanes Formula and its Condensed Structures, Branched Chain Alkane Formula, sp^3 Hybridisation – Structure and Bonding Alkenes- sp^2 Hybridisation – Benzene and its derivatives - Structure and Bonding of Alkynes - sp hybridization

UNIT III	Organic Chemistry	

Functional Groups - Nomenclature of Common Functional Groups – Electrophiles and Nucleophiles – Nucleophilic Substitution Reactions – Elimination Reactions – Addition Reactions – Electrophilic Aromatic Substitution Reactions – Nucleophilic Addition Reactions –
Organic Redox Reactions

UNIT IV	Physical Chemistry	

First Law of Thermodynamics- Adiabatic processes, Constant Volume Processes ,Enthalpy, Cyclical Processes, Free Expansions – Second Law of Thermodynamics – Irreversible Processes, Entropy, Free Energy, Real world Examples-Solar Energy, Geothermal ,Wind Power

UNIT V	Applications of ODEs	

Applicationsof1stOrder ODEs: Ecology Models - Applicationsof1stOrderODEs: Chemical Reaction Rates, Newton's Law of Cooling - Second-Order ODEs: Definitions of Homogeneous/Inhomogeneous, Linear/Non-linear ODEs –Solution of Homogeneous Constant-Coefficient Linear ODEs.

Textbook(s)	
1	Principles of Physical Chemistry, B.R.Puri, L.R.Sharma, S.Chand & Co.
2	Inorganic Chemistry, P. L. Soni, Sultan Chand & Sons.
3	A Textbook of Organic Chemistry, Arun Bahl, B.S. Bahl, S.Chand & Co.
4	OrganicChemistry,Vol.1,2 & 3,S. M.Mughergee, S.P. Singh, R.P. Kapoor, Wiley Eastern.
Reference Books	
1	Advanced Organic Chemistry, B.S. Bahl, Arunbahl, S.Chand & Co.
2	Essentials of Physical Chemistry, B.S. Bahl and G.D.Tuli, S.Chand & Co.
3	Text book of Physical Chemistry ,P.L.Soni, D.B. Dharmarke, S. Chand & Co.
4	Ordinary Differential Equations with Applications, Sze-Bi Hsu, World Scientific Publishing Co. Pte. Ltd
Related Online Contents [MOOC,SWAYAM, NPTEL, Websites etc.]	
1	https://chem.libretexts.org/
2	https://byjus.com/chemistry/
3	https://openstax.org/details/books/chemistry-2e

BIOLOGY - BIO101   Evolution and the Diversity of Life

38 h	
1	Theory of evolution: understanding life's diversity
1	Evolutionary relationships (phylogenies) are summarized in Classifications
1	Chemical evolution of life – Molecules to cells
1	Cell theory and the origin of life
2	Prokaryotic Cells: Structure and diversity of Bacteria and Archaea (2 lectures)
1	Evolution of the eukaryotic cell (Endosymbiotic theory and origin of organelles)
1	Endosymbiosis
1	Protists 1 - Red and Green algae (Features, life cycles, and evolutionary significance)
1	Protists 2 – Chromists (Diatoms, brown algae, and related groups)
1	Protists 3 - Protozoan Protist (Dinoflagellates and apicomplexans, flagellates, ciliates, amo
1 + 1	Evolution of sex (Origins and significance of sex in eukaryotes and Variations in sexual i.e. haplontic, diplontic, haplodiplontic), life cycles (Comparative study of life cycle str Protists, fungi, and algae)
1	Origins of multiculticellularity (Evolutionary transitions from unicellular to multicellular Genetic and structural adaptations)
1 + 1	Slime moulds (Types - plasmodial and cellular and Life cycle and ecological role) and f (General characteristics and classification; Reproduction and life cycles, Ecological rol economic importance)
1	Fungi 2
1	Introduction to Land Plants
1	Bryophytes (Characteristics and Significance)
1	Evolution of vascular tissue, Lycophytes, fern allies, early fossil land plants (Diversity and relevance)
1	Ferns
1	Seed plants (Structure, function, and types), the seed and secondary growth, Cycads and G
1	Conifer diversity and biology
1	Angiosperm structure, biology and diversity, the flower, double fertilization (Basic Flower and Reproductive strategies in angiosperms)
1	Angiosperm phylogeny and evolution (Wood formation and vascular cambium)
1	Introduction to animals (Metazoa)
1	Simple animals
1	Protostomes-Flatworms and annelids
1	Molluscs
1	Arthropods
1	Deuterostomes, Echinoderms-Chordates
1	Fishes –sharks/rays, teleosts, coelacanth, lungfish
1	Amphibians
1	Reptiles
1	Birds
2	Mammals
1	The Primate story

Text Book(s)	
Evolution, Strickberger. Fifth Edition, Jones and Bartlett Publishers, Inc (2013).	
Biology, P.H. Raven, G.B. Johnson, K.A. Mason, L. Jonathan, T. Duncan, Twelfth Edition, McGraw Hill (2019)	
Reference Books	
Campbell Biology, L. Urry, M. Cain, S. Wasserman , P. Minorsky, J. Reece 11th Edition, Pearson, (2017).	
Evolution, Douglas Futuyma, Mark Kirkpatrick, 4th edition, Sinauer, 2017	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.,]	
https://www.easybiologyclass.com/chemical-evolution-theory-biochemical-origin-of-life-short-lecture-notes/	
https://bio.libretexts.org/Introductory_and_General_Biology/Diversity_of_Microbes_Fungi_and_Protists	
https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/_Diversity_of_Plants	
https://www.khanacademy.org/science/biology-india/ animal-kingdom	

Course code	PHY102	PHYSICS PRACTICAL 1	2 Credits	
Core/Elective/SBS		CORE PRACTICAL		
			Syllabus Version	2023-24

LIST OF EXPERIMENTS

1. Simple Pendulum: To plot a L-T^2 graph using a simple pendulum and find the effective length of the simple pendulum for a given time period using the graph.

2. To calculate the acceleration due to gravity at a place.

3. Torsional Pendulum**:** To find the moment of inertia of the disc and the rigidity modulus of the material of the suspension wire subjected to torsional oscillations.

4. Young's Modulus: To determine the Young's modulus of elasticity of the material of a given wire using Searle's apparatus.

5. Spring: To determine the restoring force per unit extension of a spiral spring by statistical and dynamical methods and also to determine the mass of the spring.

6. Euler's Method: To determine the coefficient of friction by Euler's Method.

7. Viscosity: To determine Coefficient of Viscosity by Stoke's Method.

Reference Books

1	A textbook of practical Physics, M.N.Srinivasan, S.Balasubramanian,R.Ranganathan,Sultan Chand & Sons (2017)
2	Practical Physics and Electronics, C.C. Ouseph,U.J.Rao,V.Vijayendran,S.Viswanathan Publishers (2007)

Related Online Contents[MOOC, SWAYAM, NPTEL, Websites etc.]

https://nptel.ac.in/course.html/physics/experimentalphysicsI,IIandIII

https://nptel.ac.in/courses/115/105/115105110/

https://www.youtube.com/playlist?list=PLuiPz6iU5SQ8-rZn_LgLofRX7n8z4tHYK

Course Code	CHM102	CHEMISTRY PRACTICAL 1	2 Credits	
Core/Elective/SBS		CORE PRACTICAL		
			Syllabus Version	2023-24
		List of Experiments		

List of Physical chemistry experiments   (Any 2)

1. To determine the rate constant of the hydrolysis of Ethyl acetate using an acid catalyst.
2. Molar mass determination of some base metals, gases.
3. Determination of dissociation constant of a weak acid.
4. Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known substance.
5. Calculation of the enthalpy of ionization of ethanoic acid.

List of Inorganic chemistry experiments (Any 2)

Basic Analytical Terms: Volumetric and Gravimetric analysis, Titration,   Types of titration viz. acid base, redox, iodometric, iodometric and complexometric titrations, Types of indicators, Selection of indicator, Aquametry (Karl-Fisher titration)

1. Oxalate Complexes of Aluminum and Chromium.
2. Estimation of Fe (II) with $K_2Cr_2O_7$ using internal external (diphenylamine, anthranilic acid) and external indicator.
3. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
4. Estimation of Fe (II) and oxalic acid using standardized $KMnO_4$ solution.

List of Organic chemistry experiments   (Any 3 in Each Group)

1. Techniques:

Crystallization, Sublimation, Distillation, Steam Distillation, Vacuum   Distillation, Column Chromatography, Thin Layer Chromatography. Record   Melting Point & Boiling Point.

2. Functional group tests following functional groups

Alcohols, Alkenes, Aldehydes and Ketones, Acids, Phenols, Amines, Amides, Esters, Aromatic compounds.

3. Preparations:

Preparation of 4, 4'-Dimethoxy-dibenzylideneacetone

Preparation of 4-tert-Butylphenol

Reduction of p-nitro benzaldehyde by sodium borohydride

Nitration of Salicylic acid by green approach (using ceric ammonium   nitrate).

Bromination of cinnamic acid.

	Text Book(s)
1	Basic Principles of Practical Chemistry, Kulandaivelu A.R., Veeraswamy R., Venkateswaran, Sultan Chand & Sons, 2017
2	Practical Chemistry for B.Sc Chemistry, A.O. Thomas
3	Practical Chemistry, Pandey D.N., Sultan Chand Publishers, 2018
4	https://www.freebookcentre.net/chemistry-books-download/Chemistry-Laboratory-Manual-by-CSOS.html
	Reference
1	Vogel's Text book of Practical Organic Chemistry, Brian S. Furniss, Antony J. Hannaford, Peter W. G. Smith, Fifth Edition, Bath Press, Great Britan, 1989
2	Vogel's Textbook of Quantitative Chemical Analysis, G H Jeffery, J Bassett, J Mendham, R C Denney, Fifth Edition, Bath Press, Great Britan, 1989

Course code	BIO102	**BIOLOGY PRACTICAL**	**2 Credits**	
Core/Elective/SBS		**CORE PRACTICAL**		
			Syllabus Version	**2023-24**

	List of Experiments	

1. Basic instrumentation techniques – Principles and Operation

2. Laboratory Sterilization Methods - Principles and Operation

3. Estimation of proteins: Bradford Assay

4. Estimation of DNA: DPA(diphenylamine)method

5. Identification of sugars/carbohydrates.

6. Observation of zooplankton from pond samples under microscope.

7. Determination of dissolved oxygen in water sample.

Text Book(s)

1	Laboratory manual in biochemistry by J. Jayaraman, Wiley Eastern Publishers
2	Biochemical Methods- Sadasivam and Manickam, 3rd Edition, New Age International Publishers
3	Zooplankton Methodology, Collection & Identification – - a field manual, S.C Goswami,

Reference

1	Roy, K. Gupta, S., Nandi, S. K. (2016) Int. J. Res. Biol. Sci. 6 (1):1-6 2.
2	Aneesh E. M., Fathibi, K. and Ambalaparambil, V. S. (2017) Int. J. Recent Sci. Res. 8 (10) : 20999-21015; available athttps://www.researchgate.net/publication/321025466_Indian_Fresh_ Water_Zooplankton_A_Review_Int_J_Recent_Sci_Res_810_pp_209 99-21015

VALUE ADDED 1: ENVIRONMENTAL STUDIES

Course code	VA-1	Environmental Studies		L	T	P	C
Value Added		Value Added 1		2	-	-	2
Pre-requisite		Understanding in Environment	Syllabus Version			2023-24	

Course Objectives:
The main objectives of this course are to:
1. Evolve into ecologically informed and socially responsible citizens who are empowered to protect the natural resources while ensuring sustainable lifestyle and developmental mode

Expected Course Outcomes:	
On the successful completion of the course, student will be able to:	
1	Gaining in-depth knowledge on natural processes that sustain life	K1, K2
2	Predicting the consequences of human actions on the web of life, global economy, and quality of human life.	K1, K2
3	Develop critical thinking for environmental protection and conservation	K1, K2
4	Acquiring values and attitudes towards understanding environmental-economic-social challenges.	K1, K2
5	Adopting sustainability as a practice in life, society, and industry.	K1, K2

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create

Unit:1	Multidisciplinary nature of environmental studies	3 Hours

Unit:2	Natural Resources	4 Hours

Unit:3	Ecosystems	3 Hours

Unit:4	Biodiversity and its conservation	3 Hours

Unit:5	Environmental Pollution	3 Hours

Unit:6	Contemporary Issues	2 Hours
Case Study, Expert Lectures, Online Seminars –Webinars		
	Total Lecture Hours	**18 Hours**

	Textbook(s)
1	Erach Barucha, Textbook for Environmental Studies, UGC
2	Dr. Radha (2019), Environmental Studies, Revised Edition Prasanna Publishers

	Reference Books
1	Dharmendra S. Sengar, (2007) 'Environmental law', Prentice hall of India
2	G. Tyler Miller and Scott E. Spoolman, (2014) "Environmental Science", Cengage Learning India
3	Rajagopalan, R, (2005) 'Environmental Studies-From Crisis to Cure', Oxford University Press,
4	Benny Joseph, (2006) 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi,
5	Gilbert M. Masters, (2004) 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education,

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	Environmental Studies - By Dr. Tushar Banerjee	Devi Ahilya Viswavidyalaya, Indore - SWAYAM
	Course Designed By: **Bharathiar University**

SEMESTER II

Subject Code: MTH201	Maths 2: Algebra	4 Credits
Analysis		
Limits		**2 Hours**
Limits of Real-Valued Functions		**1**
Proving Limits using the Definition		**1**
Continuity & Differentiability		**2 Hours**
Continuity and Differentiability		**1**
Examples of Differentiable and Non-Differentiable Functions; Continuity and Differentiability of Standard Functions Including Polynomials, Trigonometric, Exponential, Log Functions and Their Inverses		**1**
Applications of Differentiation		**3 Hours**
Techniques for Evaluating Limits Including L'Hopital's Rule, Sandwich Theorem		**1**
Mean Value Theorem and Applications		**1**
Applications of Differential Calculus Eg. Related Rates		**1**
Sequences and series		
Sequences and Limits		**2 Hours**
Sequences, Limits, Convergence and Divergence		**1**
Proving Limits using Definition		**1**
Methods for evaluating limits		**1 Hour**
Methods for Evaluating Limits: Standard Limits, Limit Theorems, Continuity Rule, Sandwich Theorem		**1**
Series and Its Types		**1 Hour**
Series, Convergence and Divergence of Series, Geometric Series, Harmonic P-Series		**1**
Convergence Tests		**2 Hours**
Divergence Test, Comparison Test		**1**
Ratio Test, Integral Test, Alternating Series Test		**1**
Types of Series		**3 Hours**
Power Series, Taylor Polynomials		**1**
Taylor Series		**1**
Taylor's Theorem, Error in Taylor Polynomial Estimates		**1**
Vectors		
Algebra of Vectors		**1 Hour**
Vector Arithmetic, Vector Projections (Review)		**1**
Product of Vectors		**2 Hours**

Vector Dot Product, Vector Cross Product	**1**
Scalar Triple Product, Vector Triple Product	**1**

Parametric Form of Vector Equation	**1 Hour**
Lines and Planes in R^3	**1**

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Linear Algebra

</div>

Matrix Manipulations	**3 Hours**
Matrices, Matrix Addition, Multiplication, Transpose and Properties (Review)	**1**
Matrix Inverse	**1**
Determinant	**1**

Systems of Linear Equations	**3 Hours**
Solving Systems of Linear Equations with Gaussian Elimination	**1**
Solutions of Systems of Linear Equations - Consistency, Uniqueness	**1**
Geometric Interpretation of Solutions	**1**

Field	**1 Hour**
Field	**1**

Vector Space	**5 Hours**
R^n as a Vector Space, Linear Independence of Vectors in R^n	**1**
Span of a Set of Vectors, Subspaces of R^n	**1**
Basis and Dimension in R^n	**1**
Abstract Vector Space Axioms; Examples and Non-Examples of Vector Spaces	**1**
Bases, Dimension and Co-Ordinates in (Finite Dimensonal) Abstract Vector Spaces	**1**

Linear Transformation	**2 Hours**
Definition of Linear Transformation and Examples/Non-Examples	**1**
Linear Transformations of the Plane	**1**

Linear Transformation in Matrix Form	**2 Hours**
Change of Basis and Linear Transformations	**1**
Matrix Representation of a Linear Transformation	**1**

Applications of Linear Transformation in Matrix Form	**2 Hours**
Image and Kernel of a Linear Transformation	**1**
Rank and Nullity	**1**

Analysis:
1. Edwin Jed Herman and Gilbert Strang, Calculus - Volume I, OpenStax, 2020.
2. James Stewart, Calculus – Early Transcendentals, 7th Edition, Brooks/Cole, Cengage Learning, 2012.

Sequences and Series:
1. James Stewart, Calculus – Early Transcendentals, 7th Edition, Brooks/Cole, Cengage Learning, 2012.

2. Robert A. Adams and Christopher Essex, Calculus – A Complete Course, 7th Edition, Pearson Canada, 2009.
3. Edwin Jed Herman and Gilbert Strang, Calculus - Volume I, OpenStax, 2020.

Vector:
1. Susan Jane Colley, Vector Calculus, 4th Edition, Pearson, 2011.

Linear Algebra
1. Jim Defranza and Daniel Gagliardi, Introduction to Linear Algebra and Applications, 3rd Edition, McGraw Hill Higher Education, 2017.
2. John W. Dettman, Introduction to Linear Algebra and Differential Equations, Dover Publications, Inc., 2008.
3. S. Arumugam and A.T. Isaac, Modern Algebra, Scitech Publications (India) Pvt. Ltd., 2003.

PHYSICS 202	
Electricity and Magnetism	**No. of lectures**
Electric charge, conductors and insulators	1
Coulomb's Law, superposition principle	1
Electric field, superposition principle	1
Electric flux Examples	1
Gauss's law, applications	1
Energy and electric field; electric potential	1
Calculating potential from the field, electric potential, potential energy surfaces.	1
Electric dipoles	1
Capacitance; parallel plate capacitors	1
Energy storage in capacitors, dielectrics, series and parallel circuits	1
Conductors, electric current, electric power, Ohm's law	1
Kirchoff's rules, resistors in series and parallel circuits	1
Magnetic field, magnetic force, Lorentz force, cyclotrons	1
Lorentz force, ion velocity filter, Hall effect	1
Bio-Savart Law, Ampere's Law, solenoids, earth's magnetic field	1
Magnetic field due to a current, forces on current-carrying wires, Electromagnetic induction, magnetic flux	1
Lenz' Law, Faraday's law, Maxwell's equations, applications	1
Magnetic materials	1
Oscillations and Waves	**No. of lectures**
Simple harmonic motion, pendulum, diatomic molecules, Spring Mass System, Time period of Pendulum	2
Damped harmonic motion, resonance - electronic circuits, evolution of populations	2
One dimensional waves, Interference and standing waves, Sound waves and the speed of sound, Intensity, sound level and the physics of music Wave on Strings, Wave equation, Separable solution of wave equation, Resonance, Physics of Music: Kinds of music Instruments and their modes of sound generation	2
Doppler effect and supersonic motion, shock waves	1
Optics	**No. of lectures**
Images and mirrors Images formed by plane mirrors, Spherical mirrors, Parabolic mirrors	1
Thin lenses and optical instruments	1(2)

Image formation by lenses, Combination of lenses, Compound Microscope, Telescope	
Young's experiment, interference Superposition of waves and interference	1
Thin films and the Michaelson interferometer Thin film interference, Phase change, Michelson Interferometer	1
Diffraction by slits and apertures Diffraction expression Derivation: Single Slit, Double Slit, N-slit	1
Diffraction by gratings and X-ray diffraction	1
Optical Microscopy Microscope parts and types, Brightfield, Darkfield, Confocal microscope	1
Spectroscopy Inelastic scattering, Raman Spectroscopy, Fluorescence	1
Modern Physics	**No. of lectures**
Challenges to classical physics; special relativity Michelson Morley Experiment, Compton Scattering, Einstein's Thought experiments, Special theory of Relativity-postulates	1
Lorentz transformation, transformation of velocities, Doppler Effect Length contraction, time dilation, Twin-Paradox	1
Relativistic momentum and energy $E=mc^2$	1
Photons and the photoelectric effect Einstein's Photoelectric effect equation, Quantum of energy	1
Quantum physics, blackbody radiation, matter waves De-Broglie waves, Schrodinger Equation, Uncertainty principle	2
Trapped particles and tunneling particles 1-dimensional Potential well and barrier, Normalization and Boundary conditions	1
Bohr and Schrodinger models of the hydrogen atom	1
Complex atoms; Pauli Exclusion Principle, Periodic Table of Elements, selection rules and spectra	1
Nuclear Physics, nuclear physics, nuclear decay Nucleons, Semi Empirical Mass Equation	1
Nuclear fission and fusion	1
Quarks, Leptons, The Big Bang Fundamental forces and fundamental particles	1

1. Serway and Jewett, Physics for Scientists and Engineers, 7th edn, Brooks/Cole Publishers (2008).
2. R. Shankar, Fundamentals of Physics I, Yale Press (2019)
3. A.P. French, Vibrations and Waves, CBS Publishers & Distributors Pvt Ltd, India (2003)
4. Stephen T. Thornton & Andrew Rex, Modern Physics For Scientists and Engineers F o u r t h E d i t i

o n, Cengage Learning; 4th edition (2013)

5. A Beiser- Concepts of Modern Physics, McGraw Hill (India)(2020)
6. Hecht- Optics- 4th edn , Pearson India (2008)
7. Edward M. Purcell , David J. Morin, Electricity and Magnetism, Cambridge University Press; 3rd edition (2013)
8. Hugh D. Young , University Physics with Modern Physics Pearson Education; Fifteenth edition (2021)
9. I E Irodov, Basic Laws of Electromagnetism , Arihant Publication; Second edition (2023)

Course Code	CHM201	PHYSICAL AND INORGANIC CHEMISTRY	4 Credits	
CORE		Chemistry 2		
			Syllabus Version	2023-24

UNIT I	Chemistry of Life	

The Chemical Basis of Life - Bioenergetics - Examples of Major Bioenergetic Processes – Enzymes and Catalysed Reactions - The Chemistry Behind Enzyme Catalysis - Metabolism: Catabolism and Anabolism – Concatenation and Biopolymers – Stereochemistry and Biomolecular Chirality

UNIT II	Biochemistry & Inorganic Chemistry	

Biochemistry and Biomolecular Structure - Types of Biomolecules, Structure and Functions of Biomolecules - Small Inorganic Molecules of Biological Importance

Ionic Compounds and their Solutions - Formation, Bonding, Structure and Properties - Ionic Solutions - Structures of Solids - Classification of Solids - Types of Crystalline Solids

UNIT III	Inorganic Chemistry & Electrochemistry	

Main Group Chemistry - General Trends in Main Group Chemistry - Chemistry of s- and p-block Elements, Structure, Chemical Reactivity and Bonding Concepts

Redox Reactions and Electrochemistry - the Basics of Redox Reactions - Electrochemical Cell - Electrochemical Series - Electrode and Cell potentials - Nernst equation

UNIT IV	Inorganic Chemistry	

The Transition Metals: A Survey – Coordination Chemistry - Important Terms Involving Coordination Compounds - Bonding in Complex ions - Types of Coordination Complexes – Transition Metals in Biological Systems – Simple Harmonic Motion, Pendulum, Diatomic Molecules

UNIT V	Quantum Chemistry	

Schrödinger's Equation and Heisenberg's Uncertainty Principle – Bohr and Schrodinger Models of the Hydrogen Atom - Complex Atoms; Pauli Exclusion Principle, Periodic Table of Elements, Selection Rules and Spectra – Nuclear Fission and Fusion

Text Book(s)	
1	Textbook of Biochemistry, Seema P. Upadhye, I.K. International Publishing House Pvt. Ltd.
2	Inorganic Chemistry,P. L. Soni,Sultan Chand & Sons.
3	Principles of Physical Chemistry, B.R.Puri, L.R.Sharma ,S.Chand & Co.
4	Main Group Chemistry, 2nd Edition, A. G. Massey, Wiley Publication

	Reference Books
1	Bioenergetics: Molecular Biology, Biochemistry, and Pathology, Chong H. Kim, Takayuki Ozawa, Springer Publication
2	Essentials of Physical Chemistry, B.S.Bahl and G.D.Tuli, S.Chand &Co.
3	Principles of Inorganic Chemistry, B.R. Puri L.R. Sharma, S.Chand & Co.
4	Fundamentals of Biochemistry, J L Jain, Nitin Jain, Sunjay Jain, S.Chand&Co.
	Related Online Contents[MOOC,SWAYAM, NPTEL, Websites etc.]
1	https://chem.libretexts.org/
2	https://byjus.com/chemistry/
3	https://openstax.org/details/books/chemistry-2e

BIOLOGY - BIO201	The Biology of Cells

32 h	
2	Introduction to Cell Biology

Theme: The cell contained

2	The plasma membrane
2	Cell walls, extracellular matrix, cellulose synthesis, other cell wall components
1	Cytoplasm: content, chemistry and properties
2	Cytoskeleton, actin filaments, microtubules

Theme: Information flow in the cell

2	Nucleus, chromosomes, DNA
2	Genes and the genetic code
2	Control of gene expression

Theme: Endomembrane system and intracellular Trafficking

3	ER and ribosome, proteins and enzymes
1	Golgi apparatus
2	Vesicles, transport and secretion, Lysosomes

Theme: Harvesting energy

2	Mitochondria, ATP, energetic reactions, electron transport pathways, cellular respiration (ATP synthesis and energetic reactions, electron transport chain and oxidative phosphorylation)
2	Chloroplasts, photosynthesis, historical experiments (in photosynthesis research), pigments, photosystems (Structure and function of chloroplast, photosynthetic pigments, photosystem 1&2).

Theme: Multicellularity and the Dividing Cell

2	Cell division, cell cycle, mitosis, cytokinesis, division and distribution of organelles
1	Meiosis, formation of haploid cells
2	Communication and signaling, recognizing and responding
2	Cell differentiation and multicellularity

Text Book(s)	
1	Molecular cell biology, Harvey Lodish, 8th edition, W.H. Freeman, (2016).
2	Cell and Molecular Biology concepts and Experiments, Gerald Karp, Janet Iwasa, Wallace Marshall,9thEdition, Wiley(2019)
3	Molecular Biology of the cell, Bruce Alberts, 6th edition, Garland Science (2014)

Reference Books	
1	The Cell: A molecular approach, Geoffrey M. Cooper, Robert E. Hausman, Sixth edition, Sinauer (2013)
2	Essential Cell Biology, Bruce Alberts, 5th edition, Garland Science (2019).
3	Lewin' s Genes XII, 2017, Jocelyn E Krebs, Elliott S. Goldstein, and Stephen T. Kilpatrick

	Jones, Bartlett Publishers, 12th revised edition
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.,]	
1	**https://microbenotes.com/category/cell-biology/**
2	**https://www.larberthigh.com/_documents/%5B1405%5DUnit_1-_Cell_biology_summary_notes.pdf**
3	https://nptel.ac.in/courses/102/103/102103012/
4	**https://www.khanacademy.org/science/ap-biology/cell-structure-and-function**

Course code	PHY202	PHYSICS PRACTICAL 2		2 Credits	
Core/Elective/SBS		CORE PRACTICAL			
				Syllabus Version	**2023-24**

LIST OF EXPERIMENTS:
1.   Young's Modulus – Non-uniform pending methods
2.   Determination of the radius of a current carrying coil 2-Determination of magnetic field with the variation of distance along the axis of current carrying coil.
3.   To determine the Wavelength of main spectral line of mercury light using plane transmission grating.
4.   To determine the Refracting Angle, Refractive Index and Dispersive power of prism using spectrometer.
5.   To determine the coefficient of thermal Conductivity of bad conductor by Lee's Disc.
6.   Charging and Discharging of Capacitor.
7.   Verification of Kirchhoff's law.
Reference Books
1   A text book of practical Physics, M.N.Srinivasan, S.Balasubramanian, R.Ranganathan, Sultan Chand & Sons(2017).
2   Practical Physics and Electronics, C.C. Ouseph, U.J.Rao, V.Vijayendran, S.Viswanathan Publishers(2007)
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
https://nptel.ac.in/course.html/physics/experimentalphysicsI,IIandIII
https://nptel.ac.in/courses/115/105/115105110/
https://www.youtube.com/playlist?list=PLuiPz6iU5SQ8-rZn_LgLofRX7n8z4tHYK

Course Code	CHM202	CHEMISTRY PRACTICAL 2	2 Credits	
Core/Elective/SBS		CORE PRACTICAL		
			Syllabus Version	2023-24
	List of Experiments			

List of Physical chemistry experiments (Any 2)

1. To determine the rate of chemical reaction by using hydrolysis of tert-Butyl chloride.
2. Effects of catalase enzyme obtained from potato in cleaving H_2O_2 into H_2O and O_2.
3. To measure the vapour pressure of n-Pantane by using high vacuum line.
4. Heat of solution of KNO_3/ NH_4Cl.
5. Glass electrode- Buffer solutions: To titrate a weak base (Na_2CO_3) with a strong acid a) an acid-base indicator,(b) a glass electrode

List of Inorganic chemistry experiments (Any 2)

1. Synthesis of hexamine nickel (II) $[Ni(NH_3)_6]I_2$
2. Cuprous Chloride, Cu_2Cl_2
3. The transition metals: a survey (Transition metals in biological systems and Bonding in complex ions).
4. Estimation of Cu (II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodometrically).
5. Estimation of available chlorine in bleaching powder iodometrically.

List of Organic chemistry experiments (Any 3 in Each Group)

1. Preparation of Derivatives:

Oxime, 2, 4-DNP, Acetyl, Benzoyl, Semicarbazone, Anilide, Amide, Aryloxyacetic acid.

2. Organic single stage preparation:

The preparation of paracetamol.

The synthesis of meso-1,2-Dihydroxy-1,2-Diphenylethane.

Preparation of α-phenyl Cinnamic acid from Benzaldehyde.

Preparation of benzyl alcohol from Benzaldehyde

Preparation glucose pentaacetate from Glucose.

Preparation of 2-iodobenzoic acid from Anthranilic acid.

Use of Computer (Chemistry Software)

Chem Draw-Sketch, ISI – Draw, Draw the structure of simple aliphatic, aromatic, heterocyclic organic compounds with substituent's. Get the correct IUPAC name.

Text Book(s)	
1	Basic Principles of Practical Chemistry, Kulandaivelu A.R., Veeraswamy R., Venkateswaran, Sultan Chand & Sons, 2017
2	Practical Chemistry for B.Sc Chemistry, A.O. Thomas

3	Practical Chemistry, Pandey D.N., Sultan Chand Publishers, 2018
4	https://www.freebookcentre.net/chemistry-books-download/Chemistry-Laboratory-Manual-by-CSOS.html
Reference	
1	Vogel's Text book of Practical Organic Chemistry, Brian S. Furniss, Antony J.Hannaford, Peter W. G. Smith, Fifth Edition, Bath Press, Great Britan, 1989
2	Vogel's Textbook of Quantitative Chemical Analysis, G H Jeffery, J Bassett, JMendham, R C Denney, Fifth Edition, Bath Press, Great Britan, 1989
3	ChemDraw 17.0 User Guide, PerkinElmer Informatics Inc, 1998-2017

Course code	BIO202	BIOLOGY PRACTICAL 2		2 Credits
Core/Elective/SBS		CORE PRACTICAL		
			Syllabus Version	2023-24

	List of Experiments	

1. Microscopy and observation recording of representative organelle readymade specimens.

2. Staining of cell for observations of-Flagella, cell wall, endospores, etc.

    a. Plant cell, bacterial, fungi samples.

    b. Malachite green, safranin, Leifson flagella stain/RYU flagella stain, nitric acid, crystals of potassium chlorate (any suitable stain)

3. Introduction and visualization DNA-Proteins *insilico.*

4. Demonstration of confocal/ fluorescence microscopy at the central instrumentation facility of Bharathiar University.

5. Counting of cells using hemocytometer, observation of dead cells-Trypan blue staining.

6. Isolation of DNA: gel electrophoresis.

7. Mitosis in onion root tips – Microscopic observation

Text Book(s)

1	Cappuccino, James G., and Natalie Sherman. "Microbiology: a laboratory manual." (2005)
2	Wilson, K. and Walker, J. (2010). Principles and techniques of Biochemistry and Molecular Biology. 7th Edition. Cambridge University Press.
3	Tiwari, G. S. Hoondal, (2005). Laboratory Techniques In Microbiology & Biotechnology. Swastik publishers

Reference

1	Sri Jayachamarajendra (2018)/ pdf. Cell Biology and Genetics Lab.
2	K. R. Aneja; Laboratory Manual of Microbiology and Biotechnology, 2018. ED-TECH

IDC201	**Scientific Computation and Modeling: Introduction to simple models and programming – Total credits: 2**

- Basics of Python Programming

VALUE ADDED 2: HUMAN RIGHTS

Course code	2FB	Human Rights	L	T	P	C
Value Added		Value Added 2	2	-	-	2
Pre-requisite		Awareness on Ethics and Values	Syllabus Version		2023-24	

Course Objectives:
The main objectives of this course are to:
1. Create awareness, conviction and commitment to values for improving the quality of life through education, and for advancing social and human wellbeing

Expected Course Outcomes:	
On the successful completion of the course, student will be able to:	
1	Understand human values and value education	K1
2	Learn their role in national development	K1
3	Understand global development with ethics and values	K1
4	Learn various therapeutic methods	K1
5	Learn and understand human rights	K1

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create

Unit:1	Concept of Human Values, Value Education Towards Personal Development	3 Hours

Aim of education and value education; Evolution of value-oriented education; Concept of Human values; types of values; Components of value education. Personal Development: Self-analysis and introspection; sensitization towards gender equality, physically challenged, intellectually challenged. Respect to - age, experience, maturity, family members, neighbors, co-workers. Character Formation Towards Positive Personality: Truthfulness, Constructivity, Sacrifice, Sincerity, Self-Control, Altruism, Tolerance, Scientific Vision.

Unit:2	Value Education Towards National and Global Development	4 Hours

National and International Values: Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom, and fraternity. Social Values - Pity and probity, self-control, universal brotherhood. Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality, and faith. Religious Values - Tolerance, wisdom, character. Aesthetic values - Love and appreciation of literature and fine arts and respect for the same. National Integration and international understanding.

Unit:3	Impact of Global Development on Ethics and Values	3 Hours

Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges, and compromise. Modern Challenges of Adolescent Emotions and behaviour; Sex and spirituality: Comparison and competition; positive and negative thoughts.

Unit:4	Therapeutic Measures	3 Hours

Control of the mind through a. Simplified physical exercise b. Meditation – Objectives, types, effect on body, mind and soul c. Yoga – Objectives, Types, Asanas d. Activities: (i)Moralisation of Desires (ii)Neutralisation of Anger (iii)Eradication of Worries (iv)Benefits of Blessings

Unit:5	Human Rights	3 Hours

Concept of Human Rights – Indian and International Perspectives a. Evolution of Human Rights b. Definitions under Indian and International documents 2. Broad classification of Human Rights and Relevant Constitutional Provisions. a. Right to Life, Liberty and Dignity b. Right to Equality c. Right against Exploitation d. Cultural and Educational Rights e. Economic Rights f. Political Rights
g. Social Rights 3.Human Rights of Women and Children a. Social Practice and Constitutional Safeguards (i) Female Foeticide and Infanticide (ii) Physical assault and harassment (iii) Domestic violence (iv) Conditions of Working Women 4.Institutions for Implementation a. Human Rights Commission b. Judiciary 5.Violations and Redressal a. Violation by State b. Violation by Individuals c. Nuclear Weapons and terrorism d. Safeguards.

Unit:6	Contemporary Issues	2 Hours

Case Study, Expert Lectures, Online Seminars - Webinars

	Total Lecture Hours	18 Hours

Textbook(s)

1	Value Education – Human Rights, Bharathiar University

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	Human Rights in India - By Prof. (Dr.) Y.S.R. Murthy	O.P. Jindal Global University - SWAYAM

Course Designed By: **Bharathiar University**

SEMESTER III

SEMESTER III

Subject Code: MTH301	Maths 3: Vector Calculus, and Differential Equations	4 Credits

Linear Algebra		
Characteristic Equation		**2 Hours**
Characteristic And Minimal Polynomial		1
Cayley-Hamilton Theorem		1
Eigenvectors, Eigenvalues and Diagonalisation		**5 Hours**
Definition of Eigenvectors and Eigenvalues		1
Calculating Eigenvalues and Eigenvectors		1
Diagonalisation of Matrices; Matrix Powers		1
Orthogonal Matrices, Real Symmetric Matrices		1
Applications of Eigenvectors/Diagonalisation Eg Markov Chains		1
Inner Product Space		**4 Hours**
Inner Product Axioms; Examples/Non-Examples of Inner Products		1
Length, Angle, Cauchy-Schwarz Inequality in-terms of Inner Product		1
Orthogonality, Projections in-terms of Inner Product		1
Gram-Schmidt Algorithm		1
Vector Calculus		
Differentiation in Several Variables		**8 Hours**
Functions of Several Variables; Level Curves and Cross Sections of Surfaces		1
Common Surfaces Including Paraboloid, Ellipsoid, Hyperboloid		1
Domains and Ranges of Functions of Several Variables		1
Limits and Continuity of Functions of Several Variables; Definition Of C^N		1
Partial Derivatives, Tangent Plane		1
Differentiability of Functions of Several Variables		1
Chain Rule and Total Derivative		1
Directional Derivative, Gradient		1
Vector-Valued Functions		**2 Hours**
Parameterization of Paths		1
Vector Fields, Div and Curl Operators		1
Maxima and Minima in Several Variables		**3 Hours**
Stationary Points of Surfaces, Classification of Stationary Points using Second Derivatives		1
Optimization Applications		1
Constrained Extrema using Lagrange Multiplier Method		1
Multiple Integration		**5 Hours**
Double Integrals, Changing Order of Integration		1
Polar Co-Ordinates, Change of Variables for Double Integrals		1
Triple Integrals		1

Change of Variables For Triple Integrals; Cylindrical Co-Ordinates	1
Spherical Co-Ordinates	1

Line Integrals	**5 Hours**
Line Integrals of Scalar Functions	1
Line Integrals of Vector Functions	1
Integrals of Scalar Functions Over Surfaces, Applications of Surface Integrals Eg. Surface Area, Mass	1
Integrals of Vector Functions Over Surfaces, Flux	1
Green's Theorem	1

Surface Integrals and Its Applications	**3 Hours**
Gauss Divergence Theorem	1
Stokes' Theorem	1
Applications of Integral Theorems Eg. Maxwell's Equations	1

Partial Differential Equations	
Fourier Series	**4 Hours**
Fourier Series	1
Fourier Series: Dirichlet's, Discontinuities and Differentiation	1
Fourier Series: Weak Convergence and Series Summation	1
Linearity and Superposition	1

Applications of Partial Differential Equations	**3 Hours**
Wave Equation	1
Heat and Diffusion Equation	1
Laplace Equation and Harmonic Functions	1

Fourier Transform	**2 Hours**
Fourier Transform	1
Fourier Transform: Properties	1

Linear Algebra:
1. Seymour Lipschtuz and Marc Lipson, Linear Algebra, 3rd Edition, McGraw Hill Higher Education, 2017.
2. Thomas S. Shores, Applied Linear Algebra and Matrix Analysis, Springer International Publishing AG, 2018.
3. S.G. Venkatachalapathy, Modern Algebra, Margham Publications, 2011.
4. Kenneth Hoffman and Ray Kunze, Linear Algebra, Second Edition, Prentice-Hall of India Pvt. Ltd, 2013.
5. S.R. Patil, M.D. Bhagat, R.S. Bhamare, S.M. Waingade, N.M. Phatangare, K.D. Masalkar, Linear Algebra, Nirali Prakashan, 2018.

Vector:
1. Susan Jane Colley, Vector Calculus, 4th Edition, Pearson, 2011.
2. Gerald B. Folland, Advanced Calculus, Upper Saddle River, NJ : Prentice Hall, 2002.
3. Edwin Jed Herman and Gilbert Strang, Calculus - Volume II, OpenStax, 2016.

Partial Differential Equations:
1. T. Veerarajan, Transforms and Partial Differential Equations, 3rd Edition, McGraw Hill Education, 2016.
2. P. Sivaramakrishna Das and C. Vijaykumari, Transforms and Partial Differential Equations, 6th Edition, Pearson India, 2018.
3. G. Balaji, Transforms and Partial Differential Equations, 12th Edition, G. Balaji Publishers, 2016.

PHYSICS 302	
Quantum Mechanics	**No. of Lectures-18**
The Breakdown of Classical Physics: Failure to explain blackbody radiation. Planck's idea of quantization, Photoelectric effect	**18**
Matter Waves and Quantum Interpretation: de Broglie Waves and experimental confirmation of de Broglie's hypothesis. Electron double slit experiment. Wave-particle duality	
Quantum Mechanics in One Dimension: Basic Postulates of Quantum Mechanics, Time-dependent and independent Schrodinger equation, Stationary states, and probabilistic interpretation of quantum mechanics, One-dimensional infinite square well, Harmonic oscillator: Solving using algebraic method, Eigenfunctions, and energy eigenvalues	
Expectation values, Observables and Operators: Hermitian operators, commutator algebra, a connection of classical and quantum mechanics	
Tunneling Phenomena: Free particle, one-step potential and concept of tunneling	
Quantum Mechanics in 3-dimensions: 3d Cubic potential and degeneracy	
Hydrogen atom, hydrogenic ions, helium atoms: Qualitative solution and idea of eigenvalue and wavefunction	
Hydrogen molecule ion, hydrogen molecule: Qualitative discussion	
Thermodynamics	**No. of Lectures-17**
Temperature and the Zeroth Law of Thermodynamics. Thermal equilibrium. Ideal gases, the kinetic theory of gases, equipartition theory, Boltzmann distribution	3
Heat, work, internal energy. First law of thermodynamics. Heat capacity and enthalpy. Compression of an ideal gas under various conditions. Latent heats	2
Transport, conduction, conductivity, diffusion in gases- from mechanistic point of view	1
Multiplicity and ideal gases. Entropy, spontaneous change and the Second Law of Thermodynamics. Interacting ideal gases and the entropy of mixing.	2
Heat engines, Carnot Cycle, Otto Cycle, Stirling Cycle.	3
Gibbs Free energy and spontaneity, Helmholtz Free energy, standard free energies, free energy as a function of pressure and temperature The Fundamental equation, properties of internal energy and Maxwell's relations	2
Thermodynamics criteria for chemical and phase equilibria, chemical potential and partial molar quantities, the Gibbs Free Energy minimum	2

and equilibrium, extent of reaction and equilibrium constant, molecular description of equilibrium, response of equilibria to temperature	
Thermodynamics of liquids and liquid mixtures, chemical potentials of liquids, ideal liquid mixtures and Raoult's Law, Henry's Law, vapor pressure diagrams, liquid-liquid phase diagrams Free energy and entropy of mixing, excess functions and real solutions, solute and solvent activity, activity coefficient, osmotic pressure	2
The two-state paramagnet and the Einstein model of a solid; quantum deviations from classical equipartition. Partition function. Interacting systems, large systems, Stirling's approximation	3

Course code	CHM303	Chemistry-3 Reactions and Synthesis	4 Credits	
Core/Elective/SBS		CORE PAPER		
			Syllabus Version	2023-24

Unit:1	Organic Synthesis	08 L

- **C-C bond Forming Reactions**: Grignard Reagents and Organolithiums. Formation and reaction with Carbonyl compounds.
- **Organometallic Reagents in Synthesis**: Applications of Organocerium and Organocuprate reagents.
- **Carbonyl Compounds and Reactions**: Carbonyl compounds, Tautomerism as a general phenomen, keto-enoltautomerism of carbonyl compounds, mechanism of keto-enoltautomerism - Generating enolate anions, suitable base catalysts for enolising aldehydes, ketones, and ester and β-dicarbonyl compounds, general α- Substitution reaction. Reactions of enols and enolates, α-substitution with H/D^+Stereochemical consequences and deuterium incorporation, Halogenation of carbonyl compounds. The haloform reaction, Halogenation of carbonyls, Hell-Volhard-Zelinsky reaction, Synthetic applications of a-halocarbonyl compounds. Alkylation of enolates, LDA, scope and limitations.Aldol reaction, mechanism and retro synthesis, inter-and-intra- Molecular variants, mixed Aldol reaction. Claisen reaction, mechanism and retro synthesis, mixed Claisen and Deickman reaction. MalonateDiester Chemistry, Acetoacetate chemistry, Synthesis of Substituted acetic acid and acetone derivatives, Scope, Mechanism and Retro synthesis. Michael addition Chemistry, reaction of enolates with various Michael electrophiles.
Kinetic and Thermo dynamic enolates, Enamines and silylenol ethers

Unit:2	Redox (and important acid-base) Reactions:	08 L

- Oxidation of elements by halogens and dioxygen. Metal and main group halides and oxides. Discussion of selected syntheses, chemistry and structures of halides and oxides including amphoteric behaviour and hydroxide/aqua ion formation.
- Thermodynamic vs. kinetic control of reactions. Thermodynamic aspects of halide and oxide formation. Thermodynamic parameters, their estimation and uses of tabulations. Born-Haber cycle and construction and uses of Ellingham diagrams for these systems. (Electrides and sodides).
- Oxidation of metals by protons etc. and generation of aqua ions. Comparison of TM and main group systems and hydrolysis in TM aqua ions (acid-base chemistry of coordinated water-hydroxide-oxo ligands).Connection between electrochemical and thermo dynamic parameters. Construction and uses of Latimer and Frost diagrams. Interpretations of Frost diagrams exemplified by the more complex chemistry of main group elements, such as nitrogen.
- Thermodynamic content of plots (free energy of formation vs. oxidation state) and

predictive power. Nernst equation revisited and construction and uses of Pourbaix diagrams combining redox and acid base reactions. Comparison of chemistry of representative elements as reflected in Pourbaix diagrams.

Unit:3	Exchange reactions	06 L

- Solid/gas phase systems exemplified by transport reactions and preparation of solid-state materials, in volcanology, halogen lamps etc. Solution examples of doubled composition (metathesis).Solubility trends, Common ion effect.
- Hard/soft acid/base theory. Thermodynamic basis for HSAB theory. Usefulness in predicting direction of equilibrium and solubility.

Unit:4	Substitution Reactions	06 L

- Typical reactions and synthetic applications and examples. Inert and labile complexes. Stability (K,b) and factors affecting stability (metals, ligands). Irving-Williams series, Chelate effect. Applications of chelate effect. Siderophores. Antioxidants, garden products, chelation therapy in medicine.
- Mechanism of substitution reactions. Square planar Pt complexes and applications. Trans effect, Pt chemistry, Applications in synthesis of action of chemotherapeutic agents.
- Dissociative, interchange and associative mechanisms in substitution, racemization *etc* in octahedral complexes.
- Combination of substitution and redox chemistry in TM systems.
- Co(III) syntheses, Cr(II) catalysed substitution. Electron transfer, inner-and outer-sphere reactions.
- **Metal centered reactions**: Template reactions and reactions of coordinated ligands. Atom transfer reactions (redox reactions). Metal directed ligand syntheses

Unit:5	Thermodynamics	08 L

- Ideal gases, the kinetic theory of gases, equipartition theory, Boltzmann distribution, Heat, work, internal energy. First law of thermo dynamics. Heat Capacity and enthalpy. Compression of an ideal gas under various conditions. Latent heats, Multiplicity and ideal gases. Entropy, spontaneous change and the Second Law of Thermodynamics. Interacting ideal gases and the entropy of mixing. Gibbs Free energy and spontaneity, Helmholtz Free energy, standard free energies, free energy as a function of pressure and temperature.
- The Fundamental equation, properties of internal energy and Maxwell's relations. Thermodynamics criteria for chemical and phase equilibria, chemical potential and partial molar quantities, the Gibbs Free Energy, minimum and equilibrium, extent of reaction and equilibrium constant, molecular description of equilibrium, response of equilibria to temperature.
- Thermodynamics of liquids and liquid mixtures, chemical potentials of liquids, ideal liquid mixtures and Raoult's Law, Henry's Law, vapor pressure diagrams, liquid-liquid phase diagrams, Free energy and entropy of mixing, excess functions and real solutions, solute and Solvent activity, activity coefficient, osmotic pressure

	Student Work	
	• Assignments, Tutorials	
	• Reviews of various research papers, reports, books	**09 L**
	• Presentations	

Recommended Books/references

1	OrganicChemistryby J. McMurray, 7th Ed., Thomson, 2008.
2	Carey, F. A. and Sundberg, R. J., "Advanced Organic Chemistry, Part B: Reactions and Synthesis", 5th Ed., Springer.
3	PrinciplesofOrganicSynthesisby R. Norman and J.M. Coxon, 3rd Ed., Chapman and Hall, 1993.
4	Organic Chemistry by Clayden, J., Greeves, N. and Warren, S., "Organic Chemistry", Oxford University Press.
5	Smith, M.B., "Organic Synthesis", 3rd Ed., Academic Press.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

	1	https://chem.libretexts.org/	
	2	https://byjus.com/chemistry/	
	3	https://openstax.org/details/books/chemistry-2e	

BIOLOGY – BIO301	Functional Biology of Organisms
36	
1	Introduction to Functional Biology
	Animal biology (Humans as an example) (18 lectures)
1	Anatomy and Function 1: Tissues, Organs and Viscera
1	Anatomy and Function 2: Skeletal & Muscular system
1	Nervous system 1: The central nervous system (CNS) and nervous tissues
1	Nervous system 2: Autonomic nervous system and motor responses
1	Endocrine system 1: Endocrine and Exocrine glands
1	Endocrine system 2: HPA axis introduction
1	Respiration and Metabolism 1: Breathing in air and water
1	Respiration and Metabolism 2: Regulation of metabolism
1	Cardiovascular and circulatory system 1: Regulation of the circulatory system
1	Cardiovascular and circulatory system 2: Peripheral circulation
1	Digestive system
1	Urinary and Excretion systems 1: Anatomy and function
1	Urinary and Excretion systems 2: Osmoregulation in terrestrial & aquatic environments
1	Thermal dynamics
1	Immunology 1: Innate immune system
1	Immunology 2: Adaptive/Humoral immune system
1	Reproduction and Development 1: Gonads and the Reproductive tract
1	Reproduction and Development 2: Gametes, Fertilization and conception
	Plant biology (15 lectures)
2	Growth and Development
2	Photosynthesis
2	Water Balance Water Relations and Transport (Xylem & Phloem)
1	Phloem and translocation
2	Mineral nutrition and nutrient assimilation
2	Respiration and lipid metabolism
1	Reproduction
1	Signaling; hormones, light responses, control of flowering
1	Abiotic stress
1	Secondary metabolism and defence
2	Microbial physiology

	Text Book(s)
1	Molecular cell biology, Harvey Lodish, 8th edition, W.H. Freeman, (2016).
2	Cell and Molecular Biology concepts and Experiments, Gerald Karp, Janet Iwasa, Wallace Marshall,9thEdition, Wiley(2019)
3	Molecular Biology of the cell, Bruce Alberts, 6th edition, Garland Science (2014)
	Reference Books
1	The Cell: A molecular approach, Geoffrey M. Cooper, Robert E. Hausman, Sixth edition, Sinauer (2013)
2	Essential Cell Biology, Bruce Alberts, 5th edition, Garland Science (2019).
3	Lewin' s Genes XII, 2017, Jocelyn E Krebs, Elliott S. Goldstein, and Stephen T. Kilpatrick Jones, Bartlett Publishers, 12th revised edition
	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.,]
1	**https://microbenotes.com/category/cell-biology/**
2	**https://www.larberthigh.com/_documents/%5B1405%5DUnit_1-_Cell_biology_summary_notes.pdf**
3	https://nptel.ac.in/courses/102/103/102103012/
4	**https://www.khanacademy.org/science/ap-biology/cell-structure-and-function**

PHY302 - Physics Practical - 2 Credits

1. Michealson's interferometer: To find the wavelength of given laser beam.

2. Specific charge of the electron(e/m): To find the specific charge of the electron from the path of an electron beam in crossed electric and magnetic fields of variable strength.

3. Rydberg's constant: To find Rydberg's constant using diffraction grating.

4. Photoelectric effect: To estimate Planck's constant and work function of the photoelectrons by measuring the variation of stopping potential with the frequency of light. To see the graph of current Vs voltage for different intensity and frequency of light.

5. Electron diffraction: To measure diameter of smallest diffraction rings at different anode voltages.

6. Millikan soil drop experiment: To measure to charge of the electron.

CHM302 - Chemistry Practical - 2 Credits

List of Physical chemistry experiments

1. Thermodynamic data of electrochemical cell by e.m.f. measurements.
2. Determination of the equilibrium constant of tri-iodide ion formation
3. Determination of dipole moment f liquid at various temperatures
4. Dissociation constant of an acid-base indicator by spectrophotometry
5. Flame Photometric determination of Na, K, Li and Ca (Working curve method, standard addition method and Internal standard method)
6. A photometric titration of a mixture of Bi and Cu with EDTA(-745nm)
7. The reaction between potassium per sulphate and potassium iodide by colorimetry.
8. Hydrolysisconstantofanilinehydrochloridebydistributioncoefficient method.
9. Thermodynamic data of electrochemical cell by e.m.f. measurements.
10. Determination of the equilibrium constant of tri-iodide ion formation
11. Determination of dipole moment of liquid at various temperatures
12. Determination of concentration of sulfuric acid, acetic acid and copper sulphate by conduct o metric titration with sodium hydroxide.
13. Determine the formula and stability constant of a metal ion complex (Lead Oxalate) by polarography.

List of Inorganic chemistry experiments

1. Analysis of ore(Any one)

   i) Pyrolusite ore –Estimation of silica gravimetrically and Manganese volumetrically.

   ii) Chromite ore–Estimation of Iron gravimetrically and Chromium volumetrically

2. Analysis of Alloy

Solder alloy– Estimation of Tin gravimetrically and Lead volumetrically

3. Column Chromatography: Ion exchange capacity of resine by Co and Ni.

4. Characterization of soil and water.

List of Organic chemistry experiments

1. Separation of Binary Mixture (8-10samples)

2. Preparations: Single Stage

a. Ethyl benzene from acetophenone

b. P-Nitrobenzylcyanide from Benzyl cyanide.

c. 2,4dinitroanisolefromanisole

d. Azo dye from Anthranilic acid

e. Osazone from Glycose

f. Cinnamic acid dibromide from Cinnamic acid

g. Chalcone from P-chloro Benzaldehyde.

h. Hippuric acid from Glycine

i. 4-formyl resorcinol from Resorcinol.

j. Adipic acid from Cyclohexanone

k. 4,6 dimethyl coumarin from p-cresol.

l. Cannizzaro reaction of aromatic aldehyde.

BIO302 - Biology Practical - 2 Credits

Any 5 Experiments

1. Preparation of media, autoclaving and culturing of bacteria

2. Plating techniques

a) Pour plate b) Streaking c) Spread plate technique

3. Dilution and colony counting

4. Bacterial Growth curve

5. Enzyme kinetics (effect of pH, temperature, substrate and enzyme concentration)

6. Estimation of glucose

7. Antibiotic sensitivity test: zone of inhibition

VALUEADDED 3: YOGA FOR HUMAN EXCELLENCE (2 CREDITS)

Course code: 3FC

Yoga and Physical Health

Physical Structure- Three bodies –Five limitations

Simplified physical Exercises-Hand Exercises-Leg Exercises–Breathing Exercises-Eye Exercises – Kapalapathi

Matrarasanas-Massages -Acupuncture- Relaxational

Yogasanas-Padmasana-Vajrasanas–Chakrasanas (Side)-Viruchasanas-Yogamuthra- Patchimothasanas - Ustrasanas -Vakkarasanasi – Salabasanas

Art of Nurturing the life force and Mind

Maintaining the youthfulness-Postponing the ageing process

Sex and Spirituality-Significance of sexual vital fluid-Married life -Chastity

Ten stages of Mind

Mental frequency-Methods for concentration

Sublimation

Purpose and Philosophy of life

Introspection-Analysis of Thought

Moralization of Desires

Neutralization of Anger

Human Resources development

Eradication of worries

Benefits of Blessings

Greatness of Friendship

Individual Peace and World Peace

Law of Nature

Unified force-Cause and Effect system

Purity of Thought and Deed and Genetic centre

Love and Compassion

Cultural Education- Five-fold Culture

Textbook(s)

1. Manavalakalai Yoga, Vedathiri Publications

2. Simplified Physical Exercises–Vethathiri Maharishi, Vethathiri Publication. Yogasanas–Vethathiri Publication

3. Yoga for Modern Age–Vethathiri Maharishi, Vethathiri Publications

4. The World Order of Holistic Unity –Vethathiri Maharishi, Vethathiri - Publications

5. Sound health through yoga–Dr. K. Chandrasekaran.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1. Yoga Practices 1 –By Dr Vikas|Swami Vivekananda Yoga Anusandhana Samsthan-SWAYAM

Course Designed By: **Bharathiar University**

- - - - 23 - 886*		L	T	P	C**
AUDIT	**HEALTH & WELLNESS**	0	0	2	1

*(First four digits in the subject code is branch code and Seventh digit is Semester)

** Health & Wellness has one credit for the third semester only and it has no credits for other semesters.

Skill Areas:

Physical Fitness, Nutrition, Mental Health, Awareness on Drug addiction and its effects

Purpose:

The Health & Wellness course focuses on teaching the elements of physical, mental, emotional, social, intellectual, environmental well-being which are essential for overall development of an individual. The course also addresses the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:

Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.
4. Awareness on drug addiction and its ill effects

Focus:

During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management.
2. Breaking Bad Habits.
3. Improving Interpersonal Relationships.
4. Building Physical Strength & Inner Strength.

Role of the Facilitator:

The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.
2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.
3. **Individualised Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities:

In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being.
2. Holistic Wellness Program- Nurturing Body and Mind
3. Breaking Bad Habits Workshop.
4. Improving the elements of physical, emotional, social, intellectual, environmental and mental well-being.
5. Creating situational awareness, digital awareness.
6. Understanding substance abuse, consequences and the way out.

Period Distribution

The following are the guided activities suggested for this Audit course.

The Physical Director should plan the activities by the students.

Arrange the suitable Mentor / Guide for the wellness activities.

Additional activities and programs can be planned for Health and Wellness.

S.No	Guided Activities	Period
1	**Introduction to Holistic Well-being**	
	1. Introduce the core components of Health & Well-being namely Physical, mental and emotional well-being	
	2. Provide worksheets on all the four components individually and explain the interconnectedness to give an overall understanding.	
2	**Wellness Wheel Exercise (Overall Analysis)**	

Guide students to assess their well-being in various life dimensions through exercises on various aspects of well — being, and explain the benefits of applying wellness wheel.

- Introduce Tech Tools:
- Explore the use of technology to support well-being.
- Introduce students to apps for meditation, sleep tracking, or healthy recipe inspiration.

3 **Breaking Bad Habits (Overall Analysis)**
- Open a discussion on bad habits and their harmful effects.
- Provide a worksheet to the students to identify their personal bad habits.
- Discuss the trigger, cause, consequence and solution with examples.
- Guide them to replace the bad habits with good ones through worksheets.

4 **Physical Well-being**
1. Fitness
Introduce the different types of fitness activities such as basic exercises, cardiovascular exercises, strength training exercises, flexibility exercises, so on and so forth.
(Include theoretical explanations and outdoor activity).
2. Nutrition
Facilitate students to reflect on their eating habits, their body type, and to test their knowledge on nutrition, its sources and the benefits.
3. Yoga & Meditation
Discuss the benefits of Yoga and Meditation for one's overall health.
Demonstrate different yoga postures and their benefits on the body through visuals (pictures or videos)

4. Brain Health

Discuss the importance of brain health for daily life.

Habits that affect brain health (irregular sleep, eating, screen time).

Habits that help for healthy brains (reading, proper sleep, exercises).

Benefits of breathing exercises and meditation for healthy lungs.

5. Healthy Lungs

Discuss the importance of lung health for daily life.

Habits that affect lung health (smoking, lack of exercises).

Benefits of breathing exercises for healthy lungs.

6. Hygiene and Grooming

Discuss the importance of hygienic habits for good oral, vision, hearing and skin health.

Discuss the positive effects of grooming on one's confidence level and professional growth.

Nutrition:

Invite a nutritionist to talk among the students on the importance of nutrition to the body or show similar videos shared by experts on social media. Organize a 'Stove less/fireless cooking competition' for students where they are expected to prepare a nutritious dish and explain the nutritive values in parallel.

5   **Emotional Well-being**

1. Stress Management

Trigger a conversation or provide self-reflective worksheets to identify the stress factors in daily life and their impact on students' performance.

Introduce different relaxation techniques like deep breathing, progressive muscle relaxation, or guided imagery.

(use audio recordings or visuals to guide them through these techniques).

After practicing the techniques, have them reflect on how these methods can help manage stress in daily life.

2. Importance of saying 'NO'.

Explain the students that saying 'NO' is important for their Physical and mental well-being, Academic Performance, Growth and Future, Confidence, Self-respect, Strong and Healthy Relationships, building reputation for self and their family (avoid earning a bad name).
Factors that prevent them from saying 'NO'.
How to practice saying 'NO".

3. Body Positivity and self-acceptance

Discuss the following with the students.

- What is body positivity and self-acceptance?
- Why is it important?
- Be kind to yourself.
- Understand that everyone's unique.

(Importance of saying 'NO')
Provide worksheets to self-reflect on...
...how they feel when others say 'no' to them
...the situations where they should say 'no'

Challenge students to write a song or rap about the importance of saying no and how to do it effectively.
Students can perform their creations for the class.

6 **Social Well-Being**

1. Practicing Gratitude

Discuss the importance of practicing gratitude for building relationships with family, friends, relatives, mentors and colleagues
Discuss how one can show gratitude through words and deeds.
Explain how practicing gratitude can create 'ripple effect'.

2. Cultivating Kindness and Compassion

Define and differentiate between kindness and compassion.
Explore practices that cultivate these positive emotions.
Self-Compassion as the Foundation.

The power of small gestures.

Understanding another's perspective.

The fruits of compassion.

3. Practising Forgiveness

Discuss the concept of forgiveness and its benefits.

Forgiveness: What is it? and What it isn't?

Benefits of forgiveness.

Finding forgiveness practices.

4. Celebrating Differences

Appreciate the value of individual differences and foster inclusivity.

The World: A Tapestry of Differences (cultures, backgrounds, beliefs, abilities, and appearances).

Finding strength in differences (diverse perspectives and experiences lead to better problem-solving and innovation).

Celebrating differences, not ignoring them (respecting and appreciating the unique qualities).

Activities for celebrating differences (share culture, learn about others, embrace new experiences).

5. Digital Detox

Introduce the students to:

The concept of a digital detox and its benefits for social well-being. How to disconnect from devices more often to strengthen real-world connections.

:

(Practicing Gratitude)

Provide worksheets to choose the right ways to express gratitude. Celebrate 'gratitude day' in the college and encourage the students to honour the house keeping staff in some way to express gratitude for their service.

7   **Intellectual Well-being**

1. Being a lifelong Learner

Give students an understanding on:

The relevance of intellectual well-being in this 21st century to meet

the expectations in personal and professional well-being

The Importance of enhancing problem-solving skills

Cultivating habits to enhance the intellectual well-being (using the library extensively, participating in extra-curricular activities, reading newspaper etc.)

2. Digital Literacy

Discuss:

The key aspects of digital literacy and its importance in today's world.

It is more than just liking and sharing on social media.

The four major components of digital literacy (critical thinking, communication, problem-solving, digital citizenship).

Why is digital literacy important?

Boosting one's digital skills.

3. Transfer of Learning

Connections between different subjects — How knowledge gained in one area can be applied to others.

Intellectual Well-being.

Provide worksheets to students for teaching them how to boost intellectual well-being.

Ask the students to identify a long-standing problem in their locality, and come up with a solution and present it in the classroom. Also organize an event like 'Idea Expo' to display the designs, ideas, and suggestions, to motivate the students to improve their intellectual well-being.

8   **Environmental Well-being**

1.The Importance of initiating a change in the environment.

The session could be around:

Defining Environmental well-being (physical, chemical, biological, social, and psychosocial factors) — People's behaviour, crime, pollution, political activities, infra-structure, family situation etc.

Suggesting different ways of initiating changes in the environment (taking responsibility, creating awareness, volunteering,

approaching administration).

Providing worksheets to self-reflect on how the environment affects their life, and the ways to initiate a change.

Dedicate a bulletin board or wall space (or chart work) in the classroom for students to share their ideas for improving environmental well-being.

Creating a volunteers' club in the college and carrying out monthly activities like campus cleaning, awareness campaigns against noise pollution, (loud speakers in public places), addressing anti-social behaviour on the campus or in their locality.

9 **Mental Well-being**

1. Importance of self-reflection

Discuss:

Steps involved in achieving mental well-being (self-reflection, self-awareness, applying actions, achieving mental well-being).

Different ways to achieve mental well-being (finding purpose, coping with stress, moral compass, connecting for a common cause).

The role of journaling in mental well-being.

2. Mindfulness and Meditation Practices

Benefits of practicing mindful habits and meditation for overall well-being.

1. Connecting with nature

Practising to be in the present moment — Nature walk, feeling the sun, listening to the natural sounds.

Exploring with intention — Hiking, gardening to observe the nature.

Reflecting on the emotions, and feeling kindled by nature.

2. Serving people

Identifying the needs of others.

Helping others.

Volunteering your time, skills and listening ear.

Finding joy in giving.

3. Creative Expressions

Indulging in writing poems, stories, music making/listening, creating visual arts to connect with inner selves.

(Mindfulness and Meditation) — Conducting guided meditation every day for 10 minutes and directing the students to record the changes they observe.

10   **Situational Awareness (Developing Life skills)**

   1. Being street smart

   Discuss:

   Who are street smarts?

   Why is it important to be street smart?

   Characteristics of a street smart person: Importance of acquiring life skills to become street smart — (General First-aid procedure, CPR Procedure, Handling emergency situations like fire, flood etc).

   2. Digital Awareness

   Discuss:

   Cyber Security

   Information Literacy

   Digital Privacy

   Fraud Detection

                   (sample):

   (Street Smart) Inviting professionals to demonstrate the CPR Procedure

   Conducting a quiz on Emergency Numbers

11   **Understanding Addiction**

   Plan this session around:

   Identifying the environmental cues, triggers that lead to picking up this habit.

   Knowing the impact of substance abuse — Adverse health conditions, social isolation, ruined future, hidden financial loss and damaging the family reputation.

   Seeking help to get out of this addiction.

Provide Worksheets to check the students' level of understanding about substance addiction and their impacts.

Share case studies with students from real-life.

Play/share awareness videos on addiction/de-addiction, experts talk.

*Conduct awareness programmes on Drugs and its ill effects. (Arrange Experts from the concerned government departments and NGOs working in drug addiction issues) and maintain the documents of the program.

Closure:

Each student should submit a Handwritten Summary of their Learnings & Action Plan for the future.

Assessments:

Use Self-reflective worksheets to assess their understanding.

- Submit the worksheets to internal audit/external audit.
- Every student's activities report should be documented and the same have to be assessed by the Physical Director with the mentor. The evaluation should be for 100 marks. No examination is required.

Scheme of Evaluation

Part	Description	Marks
A	Report	40
B	Attendance	20
C	Activities (Observation During Practice)	40
	Total	100

References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary However, here are some general reference materials and resources that may be helpful:

1. **The Well-Being Wheel:**

2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.

3. **Online Resources:**
    1. United Nations Sustainable Development Goals - Goal 3 - Good Health & Well-Being: https://www.un.org/sustainabledevelopment/health/
    2. Mindfulness and Meditation: Stanford Health Library offers mindfulness and meditation resources: https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html

3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: https://jamesclear.com/habits
4. 6 Ways to Keep Your Brain Sharp
   https://www.lorman.com/blog/post/how-to-keep-your-brain-sharp
5. What Is Social Wellbeing? 12+ Activities for Social Wellness
   https://positivepsychology.com/social-wellbeing/
6. How Does Your Environment Affect Your Mental Health?
   https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687
7. How to say no to others (and why you shouldn't feel guilty)
   https://www.betterup.com/blog/how-to-say-no

SEMESTER IV

Subject Code: MTH401	Maths 4: Probability and Statistics	4 Credits
Probability		
Probability and Random Variables		**4 Hours**
Review of Probability, Events, Laws of Probability		**1**
Conditional Probability, Independent Events		**1**
Random Variables; Discrete Random Variables and Distributions; Mean, Variance and Standard Deviation of Discrete Random Variable		**1**
Bernoulli Trials		**1**
Distribution		**10 Hours**
Binomial Distribution, Poisson Distribution and Poisson Process		**1**
Continuous Random Variables and Distributions, Probability Density Functions, Cumulative Distribution Function		**1**
Mean, Variance, Standard Deviation, Median and Percentiles of a Continuous Distribution		**1**
Normal Distribution		**1**
Uniform and Exponential Distribution		**1**
Distributions of Functions of a Random Variable		**1**
Sums/Differences/Scalar Multiples of Random Variables, Independent Random Variables, Distributions of Sums/Differences of Independent Random Variables		**1**
Central Limit Theorem		**1**
Normal Approximation to The Binomial Distribution, Distribution of The Sample Mean		**1**
Distribution of Sample Proportion		**1**
Stochastic processes and Markov chains		**2 Hours**
Stochastic Processes, Markov Chains		**1**
Limiting Behavior of Markov Chains		**1**
Statistics		
Study design		**2 Hours**
Bias, Confounding, Precision, Comparison, Control		**1**
Observational Studies Vs Designed Experiments		**1**
Exploratory data analysis		**4 Hours**
Describing and Displaying Categorical Data (Tables, Frequencies, Bar Chart)		**1**
Describing and Displaying Univariate Numeric Data (Dotplots, Boxplots, Histograms, Mean, Median, Quartiles/Percentiles, Standard Deviation, Variance, IQR)		**1**
Describing and Displaying Bivariate Numeric Data (Scatterplot, Correlation)		**1**
Statistical Modeling (Single Mean Model, Multiple Means Model, Regression Model)		**1**
Sampling distributions		**1 Hour**
Sampling Distributions: Population Vs Sample, Parameter Vs Statistic; Distribution of Sample Mean, Proportion; Standard Error		**1**

Probability:

Estimation	4 Hours
Confidence Intervals, Confidence Interval for Mean (using z), Confidence Interval for Mean using t	1
Confidence Interval for Difference in Mean, Confidence Intervals for Proportion	1
Required Sample Size, Confidence Interval Vs Prediction Interval	1
Theory of estimation: Unbiasaed Estimators, Maximum Likelihood Estimators	1
Hypothesis Testing	**3 Hours**
Concepts and Terminology, Testing a Single Mean (z and t)	1
Errors, Power, 2-Sample Test, Paired Test, Testing Proportion	1
Non-Parametric Tests for 2 Samples	1
ANOVA	**2 Hours**
One-Way ANOVA	1
Theory of ANOVA	1
Regression	**2 Hours**
Least Squares Method	1
Partitioning of Variability in Regression, Significance Testing in Regression	1
Chi-squared Test	**2 Hours**
Chi-Squared Test for Independence	1
Chi-Squared Goodness-of-Fit	1

1. Seymour Lipschutz and Marc Lars Lipson, Probability, 2nd Edition, McGraw Hill Higher Education, 2010.
2. T. Veerarajan, Probability, Statistics and Random Process, 3rd Edition, McGraw Hill Education, 2017.
3. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11th Edition, Sultan Chand and Sons, 2014.

Statistics:
1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, 2021.
2. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11th Edition, Sultan Chand and Sons, 2014.
3. B.L. Agarwal, Programmed Statistics (Question-Answers), 4th Edition, New Age International Private Limited, 2021.

PHYSICS 402	
Electricity and Magnetism	**No. of Lectures -18**
Coulomb's Law - (Introduction to spherical polar coordinate, Spherical symmetry in Coulomb's law)	
Gauss's Law - (Electric field lines/Flux, Introduction to divergence and Curl, Differential and integral form of Gauss law)	
Electric Field, Potential - (Defining electric field, Electric field for a dipole and charged spherical shell, Boundary conditions of Electric field across a charged surface, Divergence and curl of electric field, Defining electrostatic potential from the Electric field)	
Conductors, Insulators - Equipotential surfaces, Properties of conductor in an electrostatic field, Electric field in presence of charged Conducting shells, Induced charges, shielding effect of conductor, Brief introduction to insulators	
Laplace equation, Poisson equation	
Curl and Stoke's theorem, Divergence Therorem- Use of divergence theorem to derive Differential form of Gauss law from integral form	
Capacitors, capacitance and energy stored in E field- Capacitor introduction, Parallel plate capacitor, Capacitance of concentric charged shells, Energy stored in capacitor, Energy stored in an electrostatic field/ due to a charge configuration	
Current and continuity equation- Ohm's law, Continuity equation- Kirchoff's law	
Magnetic field and Moving Charges- Lorentz force on a moving charged particle, cyclotron motion, Biosavart law for magnetic fields, Divergence and curl of magnetic field, Magnetic force does no work	
Force on Moving charges- Lorentz force	
Magnetic Field and vector potential- Ampere's law and its differential form	
Special relativity and E and B fields	
Induction- Lenz law, Examples of Changing magnetic fields produce current	
Inductance and energy stored in B field- Self and mutual inductance, Energy stored in an Inductor	
RC circuits- Equation of motion, Time constant, instantaneous Current and charge, Charging and discharging of capacitor	
CL and RLC circuits- Equation of motion, Time constant, Harmonic oscillations, damped Harmonic oscillations, Forced harmonic oscillations in RLC circuit connected to a battery	

Displacement current- Inconsistency in Ampere's law, Deriving displacement current vector from the Continuity equation, Maxwell's equations	
Complete Maxwell's Equations	
Electromagnetic Waves- Deriving wave equations from source free Maxwell equation, Monochromatic EM waves and their property, Energy stored in EM waves, transverse E and B fields	
Dielectrics and Electric Dipoles- Brief introduction, Electric dipole moment, atomic polarizability, polarizability tensor, Polarization vector, bound and free charges, Displacement vector, Gauss law in Dielectrics	
Dielectrics	
Magnetic Dipoles- Brief Introduction	
Magnetism in Matter	
Special relativity	**No. of Lectures -7**
Galilean Transformation, Qualitative idea of Michelson Morley experiment, Space-time and simultaneity. Einstein axioms for special relativity. The Lorentz transformation.	2/1
Relativistic kinematics; length contraction, time dilation. Doppler effect. Twin paradox.	2
Idea of space-time and Lorentz transformations, Relativistic energy and momentum, Relativistic dynamics (scattering and decay). Mass-energy equivalence. Conservation of four-momentum. Centre of momentum frame. De Broglie waves and photons.	2
Einstein, the equivalence principle, gravity, gravitational lenses, gravitational waves (qualitative)	1
Nuclear reactions and thermonuclear power.	1
Optics- Applications and microscopy	**No. of Lectures -10**
Classical optics: Fermat's Principle	1
Fourier Optics: Huygens-Fresnel Principle	1
Fourier Optics: Fresnel diffraction integral	1
Fourier Optics: Paraxial approximation	1
Fourier Optics: Fraunhofer diffraction	1
Fourier Optics: Apertures and imaging	1
Fourier Optics: phase contrast imaging	1
Microscopy applications	4/3

Relativistic dynamics. Mass-energy equivalence. Conservation of four-momentum. Centre of momentum frame. De Broglie waves and photons.	2
Einstein, the equivalence principle, gravity, gravitational lenses, gravitational waves (qualitative)	1
Nuclear reactions and thermonuclear power.	1
Optics- Applications and microscopy	**No. of Lectures**
Classical optics: Fermat's Principle	1
Fourier Optics: Huygens-Fresnel Principle	1
Fourier Optics: Fresnel diffraction integral	1
Fourier Optics: Paraxial approximation	1
Fourier Optics: Fraunhofer diffraction	1
Fourier Optics: Apertures and imaging	1
Fourier Optics: phase contrast imaging	1
Microscopy applications	4

Course code	CHM401	Chemistry-4 Structure and Properties		4 Credits	
Core/Elective/SBS		CORE PAPER			
				Syllabus Version	2023-24

Unit:1	Stereochemistry & Group Theory	08 L

- Molecular shape and simple electronic structure, Isomerism: Orbitals, hybridization and shapes of molecules, sterochemical consequences of tetrahedral carbon (isomers, enantiomers, R/S, D/L, optical rotation).
- Stereochemistry – optical activity: Molecules with more than one chiral centre (diastereomers, meso compounds, separation of racemic mixtures).
- Stereochemistry and Reactions: Prochirality, chirality in Nature, Sterochemistry on atoms other than carbon, Retrosynthetic analysis. Stereochemistry and Mechanism (nucleophilic substitution, elimination from non-cyclic compounds).
- Alkene addition reactions – Hydrogenation, halogenation, HX addition. Elimination Reactions epoxide ring forming reactions.
- Zeeman effect: Effect on the energies of a system by application of a magnetic field; Magneto chemistry, spin and orbital contribution to the magnetic moment.
- Symmetry operations and elements, Group theory: Definition of reducible and irreducible representations, Use of group theory to determine the irreducible representation, Assignment of point groups, Leading to definition of components of character tables (irreducible representations, characters – at least the interpretation of the sign of the character)
- Simple applications, Label molecular shapes, isomers, Identify chiral molecules, Physical properties – *e.g.* dipole moment, possible optical isomers, Orbital symmetry labels (*e.g.* s, p & d orbitals in Td, Oh, D4h).

Unit:2	Magnetic resonance spectroscopy's	08 L

- EPR spectroscopy, hyperfine coupling application to organic radicals and to transition metal complexes.
- Nuclear Magnetic Resonance (NMR), energies of nuclei in magnetic fields. Chemical shift and the δ scale, resonance of different nuclei, shielding, spin-orbit coupling and coupling constants, molecular symmetry. ^{13}C NMR, ^{1}H NMR, integration, multiplicity, chemical shift typical ranges - Introduction to molecular spectroscopy and spectroscopic transitions, absorbance, transmittance, the Beer-Lambert Law, intensities of spectroscopic transitions.
- Quantised vibration and simply harmonic oscillator model, wave functions, Molecular vibrational modes, vibrational spectroscopy infrared and Raman spectroscopy 3N-5, 3N-6 vibrational degrees of freedom.

Unit:3	Vibrational spectroscopy	06 L

- Vibrational symmetry and IR/Raman activity: Symmetry properties of the vibrational

degrees of freedom and to deduce IR, Raman activity. Use of internal coordinates to get symmetry properties of a subset of bands.

- Vibrational spectroscopy: Local mode approximation. Characteristic infrared absorptions (alkyl CH, alcohol, amine RN H2 and R2NH, carboxylic acid, amide, ester, ketone, aldehyde, nitrile RCN, alkyne, alkene, aromatic), fingerprint regions, interpretation of IR spectra.
- Molecular orbital theory: Electronic spectroscopy requires understanding of electronic structure leading to Molecular orbital theory – HOMO. LUMO. Diatomic molecules, LCAO-MO, Symmetry of MO's.

Unit:4	Photoelectron spectroscopy	08 L

- Generalisation of the application of MO approaches to polyatomic molecules. Hückel Theory-Aromatic and Heterocyclic Chemistry of compounds with delocalised p orbitals: Benzene and Aromaticity/Antiaromaticity, Reactions of Aromatic Compounds Electrophilic aromatic substitution. Reactions of Polycyclic and Heteroaromatic Compounds. Reactions via Aromatic Transition States Electrophilic aromatic substitution on naphthalene. Electrophilic aromatic substitution on heteroaromatics (*e.g.* pyridine and pyrrol). Non C- based aromatic systems.
- Electronic spectroscopy: Chromophores and excited electronic states, electronic transitions, UV-Vis spectroscopy, Franck-Condon Principle, Franck-Condon factors - Fates of electronic excited states – fluorescence and phosphorescence, non- radiative transitions, internal conversion and intersystem crossing, fluorescence spectra.
- Applications – light emitting polymers

Unit:5	Organometallic chemistry	06 L

- Types and broad applications of organometallic complexes and catalysts. Ligand types and examples. Group 1 (LiR) and group 2 (Grignard) and p-block chemistries. EPR spectroscopy as a tool to probe electron distribution in carbocyclic and organometallic species. Covalent interactions in coordination compounds – rationalisation of spectrochemical series in terms of bonding interactions Binary metal carbonyl complexes Synergistic bonding and the 18-electron rule. IR and NMR spectroscopy. Substitution at metal carbonyl. Other organometallic ligand types and complexes thereof. Alkyne and alkene complexes *etc*. Redox reaction in organometallic chemistry. Hydrogen complexes and oxidative addition reactions. Reductive elimination reactions. Activation and reactions of organometallic ligands. Insertions, migrations.
- **Catalysis involving transition metals**: Catalytic systems. Water gas shift reaction, hydrogenations, acetic acid process etc. Metallocene complexes and their chemistry leading to advanced polymerization catalysts etc.

Student Work	
• Assignments, Tutorials • Reviews of various research papers, reports, books • Presentations	**09 L**

	Recommended Books/references
1	Organic Chemistry by J.McMurray, 7thEd., Thomson, 2008.
2	Carey, F.A. and Sundberg, R.J.,"Advanced Organic Chemistry, Part B: Reactions and Synthesis",5th Ed., Springer.
3	Principles of Organic Synthesis by R.Normanand J.M. Coxon, 3rd Ed., Chapman and Hall, 1993.
4	Organic Chemistry by Clayden, J.,Greeves, N.and Warren,S.,"Organic Chemistry",Oxford University Press.
5	Smith, M.B.,"OrganicSynthesis",3rdEd.,AcademicPress.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://chem.libretexts.org/	
2	https://byjus.com/chemistry/	
3	https://openstax.org/details/books/chemistry-2e	

	BIOLOGY – BIO401	Transmission Genetics (Mendelian Genetics)
17		
3	Genetic variation and behaviour of genes	
2	Linkage and recombination; Mapping genes (Chromosomal Basis of Inheritance, Pedigree Analysis and Human Genetics)	
1	Chromosome maps and genetic markers	
2	Sex linkage and sex determination	
2	Complementation	
2	Chromosomal mutations	
1	Non-Mendelian inheritance	
2	Extrachromosomal DNA	
2	Quantitative genetics	
7	**Population Genetics**	
2	Genetic variation in populations	
1	Mutation and Genetic drik	
1	Natural selection	
1	Mutation/Selection balance	
1	Balanced polymorphism	
1	Gene flow & inbreeding (Migration & random mating)	
5	**Population Biology**	
1	Nature of populations; numbers, mixing (dispersal), structure in age/stage	
2	Density independent, density dependent growth (exponential and logistic growth equations)	
1	R & K selection, life-histories and links to population growth parameters, (annual vs perennial life-histories, clonality)	
1	Demography, Life tables, matrix models (requires simple matrix mathematics) and Epidemiology (simple functions)	
4	**Communities**	
1	Nature of communities; Community structure: how it is described, measured; what drives it; species composition, diversity (alpha, beta, gamma)	
1	Intracommunity (interspecific) interactions (bi-partite networks); Symbiosis, Predation, Competition, Host-parasite interactions	
1	Dynamics of communities (perturbation and succession)	
1	Biomes (communities on a global scale)	
4	**Ecosystems**	
1	Pond ecosystem (or other integrated example)	
1	Food chains and webs	
1	Pyramids (numbers, biomass, energy), abstraction, defining trophic levels, the problem of omnivory (stable isotope tracers)	
1	Biogeochemical cycles (water, C, N, P) pools and fluxes, mass budget models. Rates of processes: productivity, decomposition, trophic transfer, turnover and Mean Residence Time.	

Text Book(s) Or Reference Books

Anthony J. F. Griffiths, John Doebley, Catherine Peichel, David A. Wassarman – Introduction to Genetic Analysis. Edited by W.H. Freeman, [ISBN: 9781319114772]; 796 pages

Benjamin A. Pierce. Genetics: A Conceptual Approach; Edited by W H Freeman & Co; 6th edition; 978-1319050962: 976 pages

Daniel L. Hartl, Andrew G. Clark. Principles of Population Genetics. Sinauer Associates, USA; ISBN-13 978-0-87893-308-2: 672 pages

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.,]

https://dth.ac.in/medical/course.php

https://onlinecourses.nptel.ac.in/noc22_bt07/preview

https://www.youtube.com/watch?v=NR3779ef9yQ

https://www.youtube.com/watch?v=lRBlEV8QR4A

PHY402: Physics Practical - 2 Credits

List of experiments

1. Verification of Stefan's Law by Electrical method.

2. Study of LR circuit.

3. Study of LCR circuit

4. To determine the self-inductance of the coil using Anderson's bridge and calculate the Value of

   inductive reactance (X_L) of the coil at a particular frequency.

5. Measurement of wavelength of Laser by Diffraction Grating.

6. To determine the Wavelength of main spectral line of mercury light using plane transmission grating.

CHM402: Chemistry Practical - 2 Credits

List of Physical chemistry experiments (Any 3)

1. Determination of the stability constant of a complex by spectrophotometry.

2. The reaction between potassium persulphate and potassium iodide by colorimetry.

3. Determine the formula and stability constant of a metal ion complex (Lead Oxalate) by polarography.

4. Analysis of copper oxide and copper dioxide to determine law of multiple proportions.

5. Behaviour of water at different temperatures

List of Inorganic chemistry experiments (Any 3)

1. Photometric Analysis - To study complex formation between Fe (III) and salicylic acid and find the formula and stability constant of the complex.

2. Simultaneous determination of Cr^{+2} andCu^{+2}

3. To determine the strength of given mixture of carbonate and bicarbonate in the given mixture by pH metric method.

4. Determination of chemical oxygen demand (COD)

5. Determination of Biological oxygen demand (COD)

List of Organic chemistry experiments (Any 3)

Organic Preparations: Double Stage

1. Glycine – Hydantoic acid – Hydantoin

2. Benzoin – Benzil - Benzilicacid

3. P-cresol – 4,6-Dimethylcoumarin – 3-Bromo-4,6 Dimethyl Coumarin

4. Benzophenone – Oxime –Benzanilide

5. Acetanilide – p-Bromoacetanilide –p-Bromoaniline

6. Hydroquinone – Quinoline – 1,2,4 –Triacetoxybenzene.

BIO402: Biology Practical - 2 Credits

List of Experiments (Any 6)

1. Create an artificial mesocosm (tub/tank of defined area), and inoculate with Lemna./Azolla sp. (brought from   nearby habitats). Monitor growth, density and biomass over time.

2. a) Visit different types of water bodies (one river/stream and one quarry/pond/lake) and conduct sampling. Sampling methods (point count/line transect/quadrat) in field. Learn methods for estimating plant biomass (using GBH). (Field session)

3. Determination of population density in a natural community by quadrate method

4. Solving Genetic problems which obey Mendelian laws

5. Determination of linkage and cross-over analysis – Problem solving

6. Sex linked Inheritance in drosophila – problem solving

7. Analyze the Human karyotype chart for different genetic disorders

8. Use of ABO blood group data to calculate allele frequencies. (Data can be gathered both by interviews and by actual blood group determination)

VALUE ADDED 04: GENERAL AWARENESS (2 CREDITS)

Course code - 4FE

Following are the areas which cover the various test items prescribed in the syllabus:

1. Verbal Aptitude
2. Numerical Aptitude
3. Abstract Reasoning
4. Tamil and Other Literature
5. General Science and Technology and Education
6. Computer
7. Economics and Commerce
8. Social Studies
9. Sports
10. Current Affairs

Textbook(s)

1. General Awareness, Bharathiar University

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1. https://www.careerpower.in/gk-general-knowledge.html

Course Designed By: **Bharathiar University**

SEMESTER V

SEMESTER V

PHY501: Classical Mechanics

This course extends knowledge of fundamental thermal physics principles and introduces the powerful and elegant Lagrangian and Hamiltonian formulations of classical mechanics

PHY501: Classical Mechanics – 4 Credits	
Central force Problem	**No. of Lectures**
Nature of orbits in an attractive inverse square field	3
Kepler's laws of planetary motion. Rutherford scattering as an example of repulsive potential.	3
Mechanics of Ideal Fluids	**No. of Lectures**
Streamlines and flow lines; Equation of continuity; Euler's equation of motion;	3
Streamline motion - Bernoulli's equation and its applications. Definition of Newtonian and non-Newtonian fluids	3
Lagrangian and Hamiltonian formulation of Classical Mechanics	10
Generalized coordinates, constraints and degrees of freedom; D'Alembart's principle;	2
Lagrange's equation for conservative systems (from D'Alembert's principle; variational principle not required) and its application to simple cases	4
Generalized momentum; Idea of cyclic coordinates, its relation with conservation principles;	4
Definition of Hamiltonian, Hamilton's equation (derivation by Legendre transformation) and its application to simple cases.	4

REFERENCE BOOKS:

- Mechanics: C. Kittel, W.D. Knight, M.A. Ruderman, C.A. Helmholz and B.J.Moyer (2008) Berkeley Physics Vol 1, Tata McGraw-HillLtd
- Classical Mechanics: N. Rana and P. Joag (2001) Tata McGraw-HillEducation
- Classical Mechanics: J.R. Taylor (2005) University ScienceBooks
- Feynman Lectures in Physics, Vol I, Addison-Wesley.
- Classical Mechanics: H. Goldstein, C. Poole and J. Safko (2002) 3rd edition, Pearson
- Classical Dynamics of Particles and Systems: Thornton and Marion (2003)Thomson Learning EMEA Ltd

PHY502: Quantum Mechanics

Quantum mechanics plays a central role in our understanding of fundamental phenomena, primarily in the microscopic domain. It lays the foundation for an understanding of atomic, molecular, condensed matter, nuclear and particle physics.

PHY502: Quantum Mechanics – 4 Credits	
Time dependent and time independent Schrodinger equation	**No. of Lectures**
Eigenstates, normalization and orthonormality.	6
Simple applications of Quantum Mechanics	**No. of Lectures**
One dimensional potential well and barrier, boundary conditions, bound and unbound states.	2
Reflection and transmission coefficients for a rectangular barrier in one dimension – explanation of alpha decay.	4
Free particle in one dimensional box, box normalization, momentum eigen functions of a free particle	4
Linear harmonic oscillator, energy eigenvalues from Hermite differential equation, wave function for ground state, parity of wave function.	2
Schrodinger equation in spherical polar coordinates	**No. of Lectures**
Angular momentum operators and their commutation relations;	2
eigenvalues and eigen functions of L2 and Lz; theorem of addition of angular momenta [statement with examples].	6
The hydrogen atom problem – stationary state wave functions as simultaneous eigen functions of H, L2, and Lz;	5
radial Schrodinger equation and energy eigenvalues [Laguerre polynomial solutions to be assumed]; degeneracy of the energy eigenvalues.	5

REFERENCE BOOKS:

- Quantum Physics: S. Gasiorowicz (2003) 3rd edition, Wiley IndiaEdition
- Quantum Physics: E.H. Wichman (2008) Berkeley Physics Course, Vol 4, Tata McGraw-Hill Ltd
- Introduction to Quantum Mechanics, David J. Griffiths, PearsonEducation
- Introductory Quantum Mechanics, Richard Liboff, Addison-Wesley; 4edition
- A Modern Approach to Quantum Mechanics, John Townsend, VivaBooks
- Principles of Quantum Mechanics: R. Shankar (2010) 2nd edition,Springer

PHY503: Solid State Physics

Solid State Physics explains how the macroscopic properties of solids result from atomic scale properties. Solid State Physics forms the theoretical basis of Materials Science

PHY503: Solid State Physics – 4 Credits	
Crystal Structure	**No. of lectures**
Crystalline and amorphous solids, translational symmetry	2
Elementary ideas about crystal structure, lattice and bases, unit cell, reciprocal lattice	3
fundamental types of lattices, Miller indices, lattice planes, simple cubic, f.c.c. and b.c.c. lattices	5
Laue and Bragg equations. Determination of crystal structure with X-rays.	2
Elementary band theory	**No. of lectures**
Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. Effect of concentration and temperature on fermi level.	6
Dielectric properties of materials	**No. of lectures**
Electronic, ionic and dipolar polarizability, local fields, induced and oriented polarization – molecular field in a dielectric; Clausius-Mosotti relation.	4
Magnetic properties of materials	**No. of lectures**
Dia, para and ferro-magnetic properties of solids. Langevin's theory of diamagnetism and paramagnetism. Quantum theory of paramagnetism, Curie's law. Ferromagnetism: spontaneous magnetization and domain structure; temperature dependence of spontaneous magnetisation; Curie-Weiss law, explanation of hysteresis.	8
Superconductivity	**No. of lectures**
Introduction (Kamerlingh-Onnes experiment), effect of magnetic field, Type-I and type-II superconductors, Isotope effect. Meissner effect. Heat capacity. Energy gap. Ideas about High-Tc superconductors	5

REFERENCE BOOKS:
- Solid State Physics: N.W. Ashcroft and N.D. Mermin (1976) College edition, Harcourt College Publishers
- Introduction to Solid State Physics: C. Kittel (2004) 8th edition, John Wiley and Sons
- Atomic and Electronic Structure of Solids, E. Kaxiras; Cambridge University Press.

PHY504: Electrodynamics

Introduction to electrodynamics and a wide range of applications including communications, superconductors, plasmas, novel materials, photonics and astrophysics

PHY504: Electrodynamics – 4 Credits	
Generalization of Ampere's Law	**No. of lectures**
Displacement Current, Maxwell's Field Equations, Wave equation for electromagnetic (EM) field and its solution	4
plane wave and spherical wave solutions, transverse nature of field, relation between E and B; energy density of field, Poynting vector and Poynting's theorem, boundary conditions	4
EM Waves in an isotropic dielectric	**No. of lectures**
Wave equation, reflection and refraction at plane boundary, reflection and transmission coefficients	4
Fresnel's formula, change of phase on reflection, polarization on reflection and Brewster's law, total internal reflection.	4
EM waves in conducting medium	**No. of lectures**
Wave equation in conducting medium, reflection and transmission at metallic surface – skin effect and skin depth,	3
propagation of E-M waves between parallel and conducting plates – wave guides (rectangular only)	5
Dispersion	**No. of lectures**
Equation of motion of an electron in a radiation field : Lorentz theory of dispersion – normal and anomalous	2
Sellmeier's and Cauchy's formulae, absorptive and dispersive mode, half power frequency, band width.	6
Scattering	**No. of lectures**
Scattering of radiation by a bound charge, Rayleigh's scattering (qualitative ideas), blue of the sky, absorption.	4

REFERENCE BOOKS:

- Electricity and Magnetism: E.M. Purcell (2008) Berkeley Physics Course, Vol2, Tata McGraw-Hill Ltd
- Feynman Lectures on Physics: R.P. Feynman, R.B. Leighton and M. Sands (2011) The Millenium edition, Vol 2, Basic Books
- Introduction to Electrodynamics: D.J. Griffths (2012) Pearson Education
- Modern Electrodynamics: A. Zangwill (2013) Cambridge University Press

PHY- 505: ELECTIVE 1-Introduction to Astrophysics

The course defines and analyzes the basic concepts in astronomy. Describes the working principle of the telescope. Identifies important constellations – orient in space. Describes the planets of the solar system and their properties. Interprets the phenomena in the Universe. Describes and understand the physical processes in the Sun and other stars.

PHY505: Introduction to Astrophysics – 2 Credits	
Astronomical Scales	**No. of lectures**
Astronomical Distance, Mass and Time, Scales, Brightness, Radiant Flux and Luminosity, Measurement of Astronomical Quantities Astronomical Distances, Stellar Radii, Masses of Stars, Stellar Temperature. Astronomical techniques: Basic Optical Definitions for Astronomy (Magnification Light Gathering Power, Resolving Power and Diffraction Limit, Atmospheric Windows), Optical Telescopes (Types of Reflecting Telescopes, Telescope Mountings, Space	4
Telescopes, Detectors and Their Use with Telescopes	**No. of lectures**
(Types of Detectors, detection Limits with Telescopes). The sun (Solar Parameters, Solar Photosphere, Solar Atmosphere, Chromosphere. Corona, Solar Activity, Basics of Solar Magneto-hydrodynamics. Helioseismology). The solar family (Solar System: Facts and Figures, Origin of the Solar System: The Nebular Model, Tidal Forces and Planetary Rings, Extra-Solar Planets.	6
Stellar spectra and classification Structure	**No. of lectures**
(Atomic Spectra Revisited, Stellar Spectra, Spectral Types and Their Temperature Dependence, Black Body Approximation, H R Diagram, Luminosity Classification)	2
The milky way	**No. of lectures**
Basic Structure and Properties of the Milky Way, Nature of Rotation of the Milky Way(Differential Rotation of the Galaxy and Oort Constant, Rotation Curve of the UGC Document on LOCF Physics 189 Galaxy and the Dark Matter, Nature of the Spiral Arms), Stars and Star Clusters of the Milky Way, Properties of and around the Galactic Nucleus.	6
Galaxies	**No. of lectures**
Galaxy Morphology, Hubble's Classification of Galaxies, Elliptical Galaxies (The Intrinsic Shapes of Elliptical, de Vaucouleurs Law, Stars and Gas). Spiral and Lenticular Galaxies (Bulges, Disks, Galactic Halo) The Milky Way Galaxy, Gas and Dust in the Galaxy, Spiral Arms	6

REFERENCE BOOKS

- Galaxies in the Universe: An Introduction: L.S. Sparke and J.S. Gallagher III(2000) Cambridge University Press

- Galactic and Extragalactic Radio Astronomy: G.L. Verschuur and K.I. Kellermann (1988) Springer-Verlag

- The Physics of Stars (Manchester Physics Series): A.C. Phillips (1999) John Wiley &Sons

PHY-506: ELECTIVE 2- Nanotechnology

This course will enable students to have the knowledge of syntheses and characterization of nanomaterials. It also highlights the applications and significance of nanotechnology in terms of their properties.

PHY506: Nanotechnology – 2 Credits	
Nanoscale systems	**No. of lectures**
Length scales in physics, Nanostructures: 1D, 2D and 3Dnanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1Dnanostructures and its consequences	4
Synthesis and Characterization of nanostructure materials	**No. of lectures**
Top down and Bottom up approach, Photolithography. Ball milling. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. X-Ray Diffraction. Optical Microscopy, Scanning Electron Microscopy, Transmission Electron Microscopy, Atomic Force Microscopy, Scanning Tunnelling Microscopy.	4
Optical properties	**No. of lectures**
Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi- particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasiparticles and excitons, charging effects. Radiative processes: General formalization- absorption, emission and luminescence. Optical properties of heterostructres and nanostructures.	8
Applications	**No. of lectures**
Applications of nanoparticles. Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS).	8

REFERENCE BOOKS:

- C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).

- S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)

- K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).

- Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).

- M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).

- Introduction to Nanoelectronics, V.V. Mitin, V.A. Kochelap and M.A. Stroscio, 2011, Cambridge University Press.

- Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).

PHY507: Physics Lab I - 2 Credits

1. Verification of Hall Effect.

2. Hysteresis Loop, coercivity, saturation magnetization.

3. Susceptibility of Paramagnetic Materials by Quincke's Tube method.

4. Michelson Interferometer with He-Ne Laser.

PHY508: Physics Lab II (Analog and digital) - 2 Credits

1. Characteristics of p-n Junction diode

2. Characteristics of transistor in forward and reverse bias.

3. Characteristics of Zener diode.

PHY509: Research Project work - - 2 Credits

Combination of experimental and theoretical aspects of a problem. Perform experiment, collect data, analyze with various tools and software. Derive conclusion (positive or negative) from the work and summarize the report in form of dissertation in the VI semester

SEMESTER VI

PHY601: Statistical Physics

Statistical mechanics, the microscopic basis of classical thermodynamics, is developed in this subject. It is one of the core areas of physics, finding wide application in solid state physics, astrophysics, plasma physics and cosmology. Using fundamental ideas from quantum physics, a systematic treatment of statistical mechanics is developed for systems in equilibrium

PHY601: Statistical Physics- 4 Credits	
Microstates and macrostates	**No. of lectures**
Classical description in terms of phase space and quantum description in terms of wave functions.	1
Hypothesis of equal a priori probability for microstates of an isolated system in equilibrium. Interactions between two systems – thermal, mechanical and diffusive.	3
Statistical definition of temperature, pressure, entropy and chemical potential. Partition function of a system in thermal equilibrium with a heat bath	3
Classical statistical mechanics	**No. of lectures**
Maxwell-Boltzmann distribution law. Calculation of thermodynamic quantities for ideal monoatomic gases. Ergodic hypothesis and Liouville theorem and Ideal gases (monoatomic and diatomic): Translational, rotational, vibrational, electronic partition functions, thermodynamic functions	10
Motivations for quantum statistics	**No. of lectures**
Gibbs' paradox. Identical particle and symmetry requirement. Derivation of MB, FD and BE statistics as the most probable distributions (micro-canonical ensemble). Classical limit of quantum statistics.	6
Quantum statistical mechanics	**No. of lectures**
Bose-Einstein statistics: Application to radiation – Planck's law. Rayleigh Jeans and Wien laws as limiting cases, Stefan's law.	8
Fermi-Dirac statistics: Fermi distribution at zero and non-zero temperatures	7

REFERENCE BOOKS:

- Statistical Mechanics: K. Huang (1987) 2nd edition, Wiley
- Fundamental of Statistical and Thermal Physics: F. Reif (2008) Waveland PrInc
- Statistical Physics of Particles: Mehran Kardar (2007) Cambridge UniversityPress
- Statistical Physics- Reif-(2008)) Berkeley Physics Course, Vol 5, Tata McGraw-Hill Ltd

PHY602: Subatomic Physics

This course intends to develop familiarity with the vast areas of nuclear and particle physics as well as develop an interest in these subjects. It also helps students acquire knowledge in the content areas of nuclear and particle physics, focusing on concepts that are commonly used in this area

PHY602: Subatomic Physics -4 Credits	
Bulk properties of nuclei and Nuclear structure	**No. of lectures**
Nuclear mass, charge, size, binding energy, spin and magnetic moment. Isobars, isotopes and isotones; mass spectrometer. Nature of forces between nucleons, nuclear stability and nuclear binding, the liquid drop model (descriptive) and the Bethe-Weizsacker mass formula, application to stability considerations, extreme single particle shell model (qualitative discussion with examples)	2
Unstable nuclei and Nuclear Reactions	**No. of lectures**
Alpha decay : alpha particle spectra – velocity and energy of alpha particles. Geiger-Nuttal law. Beta decay : nature of beta ray spectra, the neutrino, energy levels and decay schemes, positron emission and electron capture, selection rules, beta absorption and range of beta particles, Kurie plot. Gamma decay : gamma ray spectra and nuclear energy levels, isomeric states. Gamma absorption in matter – photoelectric process, Compton scattering, pair production (qualitative)	2
Conservation principles in nuclear reactions. Q-values and thresholds, nuclear reaction cross-sections, examples of different types of reactions and their characteristics. Bohr's postulate of compound nuclear reaction, Ghoshal's experiment.	2
Nuclear fission and fusion	**No. of lectures**
Discovery and characteristics, explanation in terms of liquid drop model, fission products and energy release, spontaneous and induced fission, transuranic elements. Chain reaction and basic principle of nuclear reactors. Nuclear fusion: energetics in terms of liquid drop model.	6
Elementary particles	**No. of lectures**
Four basic interactions in nature and their relative strengths, examples of different types of interactions. Quantum numbers -mass, charge, spin, isotopic spin, intrinsic parity, hypercharge. Charge conjugation. Conservation laws. Classifications of elementary particles – hadrons and leptons, baryons and mesons, elementary ideas about quark structure of hadrons – octet and decuplet families. Particle Accelerator and Detector Cyclotron – basic theory, synchrotron, GM counter	18

REFEENCE BOOKS:

- Nuclear Physics – Cottingham and Greenwood (Cambridge UniversityPress).

- Concepts of Nuclear Physcics – R. Cohen (Tata-Mc GrawHill).

- Paramanu o KendrakGathan Parichay – S. N. Ghoshal(WBSBB).

- Atomic and Nuclear Physics – S. N. Ghoshal (S.Chand).

- Nuclear Physics – S. B. Patel (New Age).
- Nuclei and Particles – E. Segre (Benjamin).
- Nuclear Physics: Principles and applications – J.S. Lilley (Willey Eastern).
- Fundamentals in Nuclear Physics: from Nuclear Structure to Cosmology – J. Basdevant, J. Rich
  and M. Spiro (Springer).
- Particle Physics – Seiden (Persian Education)

PHY603: Atomic and Molecular Spectroscopy and Lasers

This course intends to throw light on the phenomenon of the interaction of light with matter in terms of the relationship with the molecular structure. The course will enable students to select molecular spectroscopy methods suitable for solving given scientific problem.

PHY603: Atomic and Molecular Spectroscopy and Lasers - 4 Credits	
Atomic Spectroscopy	**No. of lectures**
LS and JJ coupling schemes. Terms for equivalent and non-equivalent electron atom. Spectra of one and two electron systems. Electron spin, spin orbit interaction, fine structure, relativistic correction and radiation correction (Lamb Shift). Electric dipole selection rules. Intensity rules. Alkali type spectra. Zeeman effect. Paschen-Back effect. Stark effect. Hyperfine structure and isotopic shifts. Complex Spectra: Vector model for three or more valence electrons. Inverted terms. Compound doublet. Inner-Shell Excitation and Auto ionization, Line intensities, Transition probabilities, oscillator strength. Forbidden transitions.	15
Molecular Spectroscopy	**No. of lectures**
Rotational spectra of diatomic molecules. Vibrational spectra of diatomic molecules. Rotation- Vibration spectra of diatomic molecules. Classification of electronic states. Electronic spectra of diatomic molecules. Franck-Condon principle. Rotational spectra of linear polyatomic molecules: Coriolis interaction and effect of l-type doubling in linear molecules. Nuclear spin statistical weights and their effect on intensities. Rotational spectra of symmetric (prolate and oblate) molecules. Vibration-rotation spectra of polyatomic molecules: Parallel and perpendicular bands of linear molecules and symmetric top (prolate and oblate) molecules.	15
Spectroscopy (elementary and qualitative)	**No. of lectures**
Experimental techniques in spectroscopy: FTIR Raman, Stoke's antiStoke's.	3
Laser Physics Spectroscopy(elementary and qualitative)	3

REFERENCE BOOKS:

- Eisberg, R. and Resnick, R., Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles, II Edition, John Wiley,1985

- Banwell, C.N., Fundamentals of Molecular Spectroscopy, III Edition, Tata-McGraw Hill,1972

- Wilson, J. and Hawkes, J. F. B., Optoelectronics- An Introduction, Prentice Hall,1983

PHY604: Digital and Analog Electronics

This course is designed for students to know the operation and the structure of switching circuits, use and working of diodes and transistors as a switching circuits, logic families, TTL, ECL, and MOSFET and amplifiers etc

PHY604: Digital and Analog Electronics -4 Credits	
Digital Circuits	**No. of lectures**
Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and transistors)	4
De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and	5
Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map.	
Binary Addition. Binary Subtraction using 2's Complement Method). Half Adders and Full Adders and Subtractors, 4-bit binary Adder-Subtractor.	4
Semiconductor Devices and Amplifiers:	**No. of lectures**
Semiconductor Diodes: P and N type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell.	5
Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Active, Cutoff & Saturation regions Current gains α and β. Relations between α and β. Load Line analysis of Transistors. DC Load line & Q-point. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of single-stage CE amplifier using UGC Document on LOCF Physics 233 hybrid Model. Input & output Impedance. Current, Voltage and Power gains. Class A, B & C Amplifiers	12
Operational Amplifiers (Black Box approach):	**No. of lectures**
Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop and closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero crossing detector.	6

| Sinusoidal Oscillators: Barkhausen's Criterion for Self-sustained Oscillations. Determination of Frequency of RC Oscillator | |

REFERENCEBOOKS:

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.

- Electronic devices & circuits, S. Salivahanan & N.S. Kumar, 2012, Tata Mc-Graw Hill

- Microelectronic Circuits, M.H. Rashid, 2nd Edn., 2011, Cengage Learning.

- Modern Electronic Instrumentation and Measurement Tech., Helfrick and Cooper,1990, PHI Learning

- Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw Hill

- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.

PHY605: ELECTIVE 3- Renewable Energy and Energy Harvesting

This course enables the students to outline the principles of energy harvesting systems as well as methods of electro-mechanical conversion, principle of photovoltaic cells and thermoelectric generators. They will be able to describe the physical principles of energy harvesting methods mainly electro-mechanical conversion and simulation modeling of such mechatronic systems.

PHY605: Renewable Energy and Energy Harvesting **- 2 Credits**	
Fossil fuels and Alternate Sources of energy	**No. of lectures**
Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity	3
Solar energy	**No. of lectures**
Its importance, storage of solar energy, solar pond, no convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption	3
Ocean Energy, Hydro Energy and Geothermal Energy	**No. of lectures**
Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. (3 Lectures) Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. (2 Lectures) Geothermal Resources, Geothermal Technologies. Hydropower resources, hydropower technologies, environmental impact of hydro power sources	6
Piezoelectric Energy harvesting	**No. of lectures**
Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric Energy harvesting applications, Human power	4
Electromagnetic Energy Harvesting	**No. of lectures**
Electromagnetic Energy Harvesting	2
Linear generators, physics mathematical models, recent applications	2
Environmental issues and Renewable sources of energy, sustainability.	2

REFERENCE BOOKS:

- Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi

- Solar energy - M P Agarwal - S Chand and Co. Ltd.

- Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.

- Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004,Oxford

  University Press, in association with The Open University.

- Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook,2009

- J.Balfour, M.Shaw and S. Jarosek, Photo voltaics, Lawrence J Goodrich (USA).

- http://en.wikipedia.org/wiki/Renewable_energy

PHY606: ELECTIVE 4 -Introductory Biophysics

This course will enable students to define the fundamental concepts of biophysics. The course explains the integration of physical theory into biological processes

PHY606: Introductory Biophysics - 2 Credits	
Thermodynamics of living systems	**No. of lectures**
Conservation of energy in living systems, Entropy and Life, Gibbs and Standard free energy, Equilibrium constant, Coupled reactions.	2
Dynamics of biomolecules	**No. of lectures**
Diffusion, Laws of diffusion, Active transport, facilitated diffusion, Osmosis, Osmotic pressure, Osmoregulation, Viscosity and biological importance, Surface tension, Factors influencing surface tension, Biological importance.	4
Atomic & Molecular structure	**No. of lectures**
Structure of atom-Models & theories, Periodic table, Concept of bonding; valence of carbon; hybridizations of carbon; hybridizations of nitrogen & oxygen; molecular orbital theories, polar & non polar molecules; inductive effect; Secondary bonding: weak interactions, hydrogen bonding; dipole-dipole & dipole induced dipole interactions; London dispersion forces. Bonds within molecules-Ionic, covalent, Hydrogen, Electrostatic, Disulphide& peptide bonds, Van-der Waals forces Bond lengths & Bond energies, Bond angles, Structural isomerism; optical isomerism & optical activity.	8
Physico-chemical Foundations	**No. of lectures**
Biophysics of Water: Physicochemical properties of water, Molecular structure, Nature of hydrophobic interactions, Water Structure. Small-Molecule Solutes: Hydrophiles, Hydrophobes, Large Hydrophobic Solutes and Surfaces, Aqueous Environment of the Cell, State of water in bio- structures & its significance, Protein Hydration-Nonspecific Effects, The Hydration Shell. Acid	12
& Bases: Acid-Base theories, Mole concept, Molarity, Molality & Normality, Ampholyte, concept of pH, measurements of pH , Henderson–Hasselbatch equation , Titration curve & pK values, Buffers & Stability of their pH , numerical problems. Redox potential : Oxidation –Reduction, examples of redox potential in biological system	

REFERENCES BOOKS:

- Biochemistry by Voet and Voet
- Biological Thermodynamics by Donald T.Haynie
- Introductory Biophysics by J. R. Claycomb and J.Q.P.Tran
- Molecular and Cellular Biophysics by Meyer B.Jackson

PHY607- Physics Lab I - 2 Credits

1. Determine Planck's constant using Photo Vacuum Tube.

2. Refractive index of transparent material.

3. Study of Zeeman Effect.

4. G M counting set up for radioactive experiments.

PHY608- Physics Lab II (Analog and digital) - 2 Credits

1. Verification of Logic Gates.

2. Charging and Discharging of Capacitor.

3. Verification of Kirchhoff's law.

4. Solar Power Lab

PHY609- Research Project work - 2 Credits

Combination of experimental and theoretical aspects of a problem. Perform experiment, collect data, analyze with various tools and software. Derive conclusion (positive or negative) from the work and summarize the report in form of dissertation in the VI semester.

Instruction : PEOs are:	
Program Educational Objectives (PEOs) **PART –I TAMIL program**	
PEO1	தமிழ்மொழி வளங்களை அறிதல்.
PEO2	இலக்கியம் கூறும் தமிழ் வரலாற்றினை அறிதல்.
PEO3	தமிழ்வரலாற்றினை உறுதிப்படுத்தும் சான்றாதாரங்களை உணர்தல்.
PEO4	தமிழ் இலக்கணக் கூறுபாடுகளை உள்வாங்குதல்.
PEO5	நிகழ் மொழியிலக்கணக் கோட்பாடுகளைக் கற்றல்.
PEO6	தமிழ்மொழியை முறையாகப் பயன்படுத்தும் திறன் வளர்த்தல்.
PEO7	தமிழ்மொழிக் குடும்பங்களுக்கிடையேயான உறவுகளை அறிதல்.
PEO8	தமிழ்ச் சொற்பொருள் உறவுகளைக் கற்றல்.
PEO9	மொழியைப் பயன்பாட்டு நோக்கில் அணுகுதல்.
PEO10	திறன்சார் கருத்துப் பரிமாற்றத்திற்கு உரியவர்களாய் உருவாக்குதல்.

Program Specific Outcomes (PSOs)

After the successful completion of PART-1 program, the students are expected to

PSO1	தமிழ்மொழி வளங்களைக் கற்றுக் கொள்வர்.
PSO2	தமிழ் மொழியின் வரலாற்றுச் சிறப்பினை உணர்தல்
PSO3	தமிழ்மொழி வளர்ச்சிக்கு பங்களிப்பை நல்கும் மனப்பான்மை உடையோராதல்.
PSO4	மரபிலக்கண அறிவு பெறுதல்
PSO5	மொழியியல் சிந்தனையில் மொழியை அணுகும் திறன் பெறுதல்.
PSO6	பிழைகளைக் களைந்து மொழியறிவு பெற்றோராய் மிளிர்வர்.
PSO7	தமிழ் மொழிக்குடும்ப உறவுகளையறிந்து இணக்க மனநிலை பெறுதல்.
PSO8	சொல்லாட்சித் திறனுடையோராதல்.
PSO9	மொழிசார் அணுகுமுறையுடையோராதல்
PSO10	ஆற்றல் மிக்க மொழியாளுமையுடையோராதல்.

Program Outcomes (Pos)	
On successful completion of the PART-I Tamil Program	
PO1	தமிழ்மொழி வளங்களைக் கற்றுக் கொடுத்தல்.
PO2	மொழி வரலாற்று உணர்வோராய் உருவாக்குதல். அதன் வழி மரபுகளை மீட்டெடுக்கக் கற்றுக் கொடுத்தல்
PO3	மொழியறிவினைப் புகுத்துதல்.
P04	மொழிவழிச் சிந்தனைகள் வழி நன்னெறிசார் வாழ்வை அமைக்க வழிகாட்டுதல்.
P05	கருத்துப் புலப்பாட்டுத் திறனுக்கான பயிற்சியளித்தல். போட்டித் தேர்வுகளில் திறன்மிகு பங்களிப்பை வழங்கச் செய்தல்.

BHARATHIAR UNIVERSITY: COIMBATORE 641 046
PART- 1 CURRICULUM FOR MAJOR TAMIL (AFFILIATED COLLEGES)
FOLLOWED BY TANSCHE SYLLABUS- AUGUST-2022
(For the students admitted during the academic year 2025-2026 onwards)

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	INSTRUCTION HOURS	DURATION THE HOURS (EXAM)	MAXIMUM MARKS			CREDIT
					CIA	ESE	TOTAL	
I	11T	தமிழியல் ஆதார வளங்கள்	6	3	25	75	100	4
II	21T	தமிழ்மொழி அமைப்பியல்	6	3	25	75	100	4
III	31T	தமிழ்ப் பொருண்மையியல்	6	3	25	75	100	4
IV	41T	தமிழகக் கலைகள்	6	3	25	75	100	4

சிறப்புத் தமிழ்
(பகுதி1-பொதுத் தமிழ்)
மொத்த மதிப்பெண்கள்-100
பல்கலைக் கழக வினாத்தாள் அமைப்பு முறை

வ.எ	பிரிவு	மொத்த மதிப்பெண்கள் 75
1	பிரிவு-அ சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக. ஒவ்வொரு அலகிலிருந்தும் இரண்டு வினாக்கள் இடம் பெற வேண்டும்.	10×1=10
2	பிரிவு-ஆ இரு பக்க அளவில் விடை தருக . ஐந்து அலகுகளிலிருந்தும் இது அல்லது அது என்ற வகையில் வினாக்கள் அமைய வேண்டும். (அலகு ஐந்திற்கான வினா- பொருத்துக முறையில் தருக்கமுறையிலான வடிவில் ஐந்து சிறு தொடர்களாக அமைய வேண்டும்)	5×5=25
3	பிரிவு-இ கட்டுரை வடிவில் விடை தருக. ஐந்து அலகுகளிலிருந்தும் இது அல்லது அது என்ற வகையில் வினாக்கள் அமைய வேண்டும்.	5×8=40

அகமதிப்பீட்டுத் தேர்வு மதிப்பெண் பிரிப்பு முறை
மொத்த மதிப்பெண் -25

வ.எண்	பிரிவு	மதிப்பெண்
1	அகமதிப்பீட்டுத் தேர்வு – 1,11	10
2	மாதிரித் தேர்வு	10
3	ஒப்படைப்பு	5

தாள்-1 தமிழியல் ஆதார வளங்கள்

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
11T	PART-1 TAMIIL PAPER-1 தமிழியல் ஆதார வளங்கள்		Y	-	-	-	6	4	25	75	100

	CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE (பொதுத் தமிழ்ப் பாடத்திற்கு மாற்றாக)
PRE-REQUISITE	இளங்கலைப் பட்டக் கல்விக்குத் தமிழை முதன்மைப் பாடமாக எடுத்திருத்தல்.	

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- தமிழ் பயிலும் மாணவர்கள் தமிழியல் தொடர்பாக உள்ள ஆதார வளங்களை அறிதல்.
- தமிழியல் வள ஆதாரங்கள் கிடைக்கும் இடம், அவற்றைப் பயன் கொள்ளும் முறை முதலியவற்றை மாணவர்கள் அறிந்து பயன்பெற அவர்களை ஆற்றுப்படுத்துதல்.
- அவற்றைப் பயன்படுத்தும் தொழில் நுட்ப அறிவை அடைதல்.
- அத்தகைய ஆதார வளங்களை உருவாக்கும் முனைப்பைப் பெறல்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	அறிவியல் தொழில் நுட்ப வளர்ச்சியின் வழி தமிழைக் கற்பர்.	K2,k3
CO 2	தரவுகள் கிடைக்கும் இடங்களை அறிந்து கொள்ளுவர்.	K1,
CO 3	குறைந்த நேரத்தில் மின்நூலகங்களைப் பயன்படுத்தும் முறையையும் திறனையும் அறிவர்.	K2,k4
CO 4	வாசிப்புத்திறனை அதிகரித்தலின் மூலமாகப் பகுத்தறியும் திறன் பெறுவர்.	K5.k4
CO 5	இதன்வழி தமிழுக்குப் புதிய ஆதார வளங்களை உருவாக்குவர்.	K5,k6

K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE

UNIT -I	கல்வெட்டுகள் - செப்பேடுகள் - சுவடிகள் நாணயங்கள்- பிறஆவணங்கள்நூல்கள் –இதழ்கள்- நூலகங்கள்,அருங்காட்சியகங்கள், அகழ்வைப்பகங்கள்.	18 CONTACT HOURS
UNIT - II	மின்நூல்கள் - மின்நூலகங்கள் - மின்இதழ்கள் – பேசும்புத்தகங்கள் (audio books) - விக்கிப்பீடியா – தமிழ் விக்சனரி- மின்அகராதிகள்	18 CONTACT HOURS
UNIT - III	தமிழ் இணையக் கல்விக் கழகம்- தமிழ் மொழி தொடர்பான இணையத் தளங்கள்-அரசு மற்றும் தனியார் குறுவட்டுகள்- வலைப்பூ - இலக்கியம் சார்ந்த வலைப்பூக்கள் – பொதுவான வலைப்பூக்கள்.	18 CONTACT HOURS
UNIT - IV	தமிழ் மென் பொருள்கள் – ஒலிபெயர்ப்பு, மொழிபெயர்ப்பு, சமூக வலைத் தளங்கள்: உள்ளடக்கம் –பயன் கொள்ளும் முறைகள்– தரவிறக்கம் செய்யும்முறை –மின்பெயர்ப்புகள் (pdf to word - word to pdf etc)	18 CONTACT HOURS
UNIT - V	திறன்பேசிச் செயலிகள் - செயல்படும்முறைகள் – தமிழ்மொழியின் பயன்பாடு - விசைப்பலகை - குரல் பதிவில் தட்டச்சு உள்ளீடு, எழுத்து முறை மாற்றி.	18 CONTACT HOURS
	TOTAL LECTURE HOURS	**90**
	Text Book	
	தமிழியல் ஆதார வளங்கள் முனைவர் ச.வைத்தீஸ்வரன். முனைவர் ஹ.விஜயலெட்சுமி - அரசுக் கலைக் கல்லூரி திருவண்ணாமலை. வெளியீடு :நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட். (அக்டோபர் 2024) சென்னை.	
	REFERENCE BOOKS	
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	இல.சுந்தரம், கணினித்தமிழ், விகடன் பிரசுரம், 2015	
	சோமலே, வளரும்தமிழ், வானதி பதிப்பகம், 1988	
	முனைவர் மு.இளங்கோவன் , இணையம் கற்போம், வயல்வெளிப் பதிப்பகம், அரியலூர், 612901.	
	முனைவர் துரை மணிகண்டன், வலைப்பூ(web biog), கௌதம் பதிப்பகம் , சென்னை -50	
	முனைவர் துரை மணிகண்டன், இணையமும் தமிழும், நல்நிலம் பதிப்பகம், சென்னை -17	

WEB SOURCES
• Tamil virtual University Library- www.tamilvu.org/
• Project Madurai - www.projectmadurai.org.
• Chennai Library- www.chennailibrary.com http://www.chennailibrary.com>.
• Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.
• Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com
• Tamil Books on line- books.tamil cube.com
• Catalogue of the Tamil books in the Library of British Congress archive.org
• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	M	S	S
Co2	S	S	M	S	S
Co3	S	M	S	S	S
Co4	S	M	S	M	S
Co5	S	S	S	M	S

S-Strong; M-Medium; L-Low

9

தாள்-2 தமிழ்மொழி அமைப்பியல்

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
21T	PART-1 TAMIIL PAPER-11 தமிழ்மொழி அமைப்பியல்		Y	-	-	-	6	4	25	75	100

	CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE (பொதுத் தமிழ்ப் பாடத்திற்கு மாற்றாக)
PRE-REQUISITE	இளங்கலைப் பட்டக் கல்விக்குத் தமிழை முதன்மைப் பாடமாக எடுத்திருத்தல்.	

LEARNING OBJECTIVES
THE MAIN OBJECTIVES OF THIS COURSE ARE TO :
• மொழியின் பண்புகளையும் பயன்பாட்டையும் பொதுநிலையில் அறிதல்   • மொழிக்குடும்பம், மொழிகளுக்கிடையேயான உறவுகளை அறிதல்   • தமிழ் மொழியின் அமைப்பியல்புகளை ஒலி, சொல், தொடர் முதலிய நிலைகளில் புரிந்துகொள்ளுதல்   • தமிழ்ப் பனுவல்களில் உள்ள மொழி அலகுகளைப் பகுத்தாயும் திறன் பெறல்   • மொழிக்கூறுகளைச் செம்மையாகப் பயன்படுத்தும் திறன் பெறல்

EXPECTED COURSE OUTCOMES
ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO
இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	தமிழ் மொழியின் அமைப்புக் கூறுகளைத் தெளிவாக அடையாளம் காணுவர்.	K1,k2
CO 2	தமிழ்ச் சொல்லமைப்பு நியதிகளைப் புரிந்து கொள்வர்.	K2,
CO 3	தொடரமைப்பு விதிகளையும் வகைகளையும் அறிந்திருப்பர்.	K3,k4
CO 4	மொழிப்பனுவலை அலகிட்டுப் பகுத்தாயும் திறன் பெற்றிருப்பர்.	K5.k4
CO 5	தேவைக்கேற்ப பொருத்தமான பனுவலை உருவாக்கும் ஆற்றல் பெற்றிருப்பர்.	K5,k6

K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE

	தமிழ்மொழி	
UNIT -I	தமிழ்மொழியின் பழைமை- செவ்வியல் மொழி- நவீன மொழி- அறிவியல் மொழி- கணினி மொழி- கன்னித் தமிழ்- செவ்வியல் மொழி மட்டுமல்ல, நவீன மொழியும் கூட- நாற்பதுக்கும் மேற்பட்ட நாடுகளில்- தமிழ் மொழியும் பிற இனமொழிகளும்- தமிழும் ஜப்பான் மொழியும்- இந்திய மொழி திராவிட மொழி-இந்திய மொழிகள்- நான்கு வெவ்வேறு மொழிக் குடும்பங்கள்- இந்தோ ஆரிய மொழிகள்- பதினெட்டு ஆட்சி மொழிகளில் பதின்மூன்று- சைனோதிபேத்தியபர்மிய மொழிகள்-ஆஸ்திரோ ஆசிய மொழிகள் அல்லது முண்டா மொழிகள்-திராவிட மொழிகள்-மொழிகள் 1 திருந்திய மொழிகள், 2.திருந்தா மொழிகள்- திராவிட மொழிகளில் இலக்கியங்கள்- இக்காலத் தமிழ்-மொழி இலக்கணம்.	18 CONTACT HOURS
	ஒலியனியல்	
UNIT -II	மொழி ஒலிகள்- தமிழ் மொழி ஒலியன்கள்- ஒலி வகைப்பாடு- இடமும் முறையும்- ஒலியுறுப்புக்கள்'- வாயொலிகளும் மூக்கு ஒலிகளும்- ஒலிப்புடை ஒலிகள் ஒலிப்பில்லா ஒலிகள்- உயிரொலிகள் மெய்ஒலிகள்- உயிர் ஒலிகள்,பிறப்பும் வகையும்- குறிலும், நெடிலும்- ஐகார ஔகாரங்கள்- தமிழ் உயிர் ஒலியன்களின் பெயர்- மெய்யொலிகள்: பல்வேறு தடைகள்- பல்வேறு மெய்யொலிகள்- நாவளை ஒலி (Retroflex)- மெய்யொலிகள்- அண்ணமும் நாக்கும் இதழும் பல்லும்- ஒலியனும் மாற்றொலிகளும்- உயிர் ஒலியன்களும் மாற்றொலிகளும்-மெய்யொலியன்களின் மாற்றொலிகள்- மரபு இலக்கண எழுத்து வகைப்பாடு- உயிரெழுத்து- மெய்யெழுத்து- ஆய்தவழுத்து-ஒலியன்களின் வருகைமுறை (Distribution)- ஆய்தம்-மெய்யொலியன்கள் வரும் இடங்கள்- மெய்ம் மயக்கங்கள்- இரு மெய்ம் மயக்கம்- உடனிலை மெய்ம்மயக்கம்- வேற்று நிலை மெய்ம்மயக்கம்- வெடிப்பொலியன்களை முதலாகக் கொண்டவை- மூக்கொலியன்களை முதலாகக் கொண்டவை- மருங்கொலியன்களை முதலாகக் கொண்டவை- உயிர்ப் போலிகளைக் கொண்டவை- மூன்று மெய்ம்மயக்கங்கள்- பிறமொழிச் சொற்கள்- மொழிக்கு முதலில் மெய்ம்மயக்கங்கள்- கிரந்த எழுத்துக்கள்- ஆய்தம், பயன்பாடு.	18 CONTACT HOURS

		புணரியல்	
UNIT -III		புணர்ச்சி அல்லது சந்தி- நிலை மொழி வருமொழி-வேர்ச்சொல்லும் அடிச் சொல்லும்- புணர்ச்சி வகைப்பாடுகள்- அகப்புணர்ச்சி புறப்புணர்ச்சி- இயல்புப் புணர்ச்சி விகாரப் புணர்ச்சி- விகாரப் புணர்ச்சி வகைகள் தோன்றல் திரிதல் கெடுதல்- உயிரீற்றுப் புணர்ச்சி- மெய்யீற்றுப் புணர்ச்சி- குற்றியலுகரப் புணர்ச்சி- வேற்றுமைப் புணர்ச்சியும் அல்வழிப் புணர்ச்சியும்- வேற்றுமைப் புணர்ச்சி-வகைப்பாடு- உருபுப் புணர்ச்சி- பெயர்களில் மாற்றம் : பதிலிடு பெயர்களில்-பெயர்களில்-சாரியைப் புணர்ச்சி-அத்துச் சாரியை- அற்றுச் சாரியை-அன் சாரியை- இன் சாரியை- அம் சாரியை- தொகாநிலைத் தொடகும். தொகுநிலைத் தொடரும்- வேற்றுமை உருபுகள் தொக்கி வரும் போது- தொகாநிலைத் தொடர்- அல்வழிப் புணர்ச்சி- எழுவாய் விளி வேற்றுமைகள்- பெயரெச்சமும் பெயரை விசேடித்து நிற்பனவும்- ஈறுகெட்ட எதிர்மறைப் பெயரெச்சமும் பிறவும்- அளவும் எண்ணும்- செய்வேன் எச்சம்-வினையடைகள்- செய்தென் செய்தால் எச்சங்கள்-பிற எச்சங்கள்-தொகைப்புணர்ச்சி-வேற்றுமையும் அல்வழியும்- வேற்றுமைத் தொகை- வினைத் தொகை-பண்புத் தொகை- இருபெயரொட்டுப் பண்புத் தொகை-உவமைத் தொகை- உம்மைத் தொகை -அன்மொழித் தொகை- சில சொல் புணர்ச்சிகள்- சொல் புணர்ச்சி-உடம்படு மெய்ப் புணர்ச்சி- குற்றியலுகரப் புணர்ச்சி-மெய்யீற்றுப் புணர்ச்சி-தனிக்குறில் முன்- மகர ஈற்றுப் புணர்ச்சி-ணகர ஈறு- யகர ஈறு-ரகர ஈறு-லகர ஈறு- ழகர ஈறு-எகர ஈறு-னகர ஈறு-பிறமொழிச் சொற்கள் - வல்லின ஈறுகள்-மகர ஈறு-ஸகர ஷகர ஈறுகள்-ங ஞ ஈறுகள்- நெருடல் நிறைந்தது.	18 CONTACT HOURS
		சொல்லியல்	
UNIT -IV		சொல்- சொல் வகைப்பாடு- பெயர்ச்சொல்-பெயர்ச்சொல்லின் பல்வேறு பண்புகள்- பெயர்ச்சொல் வகைப்பாடு- சிறப்புப் பெயர் -பொதுப் பெயர் -எண்ணப்படு பெயர் திரட் பெயர்- இடப்பெயர்- காலப்பெயர்- பண்புப் பெயர்- வினைப் பெயர்கள் அல்லது ஆக்கப் பெயர்கள் -உயிர் நீட்டம்- ஈற்றயல் இரட்டித்தல்- எண்ணுப் பெயர்கள்-திணை, எண், பால் ,பகுப்பு- திணை எண் பால் காட்டும் முறை- ஆண்பால் பெயர்கள், ஆண்பால் விகுதிகள் ,பெண்பால் பெயர்கள், பெண்பால் விகுதிகள்,	18 CONTACT HOURS

	பொதுப்பெயர்கள், உயர்வு உரிமைப் பெயர்கள், உயர்வு ஒருமை விகுதிகள், பலர்பால் பெயர்கள், பலர் பால் பெயர் விகுதிகள்- பதிலிடு பெயர்கள்- ஆகுபெயர்- வேற்றுமை மொழி -வேற்றுமை அடிப்படை பொருள்தொடர்பு காட்டுவது-வேற்றுமை உருபுகள் ஏற்கும் இடம்- வேற்றுமைக்குரிய சில பண்புகள்- வேற்றுமைகளின் எண்ணிக்கை-பெயரடை பொருளின் பண்பைச் சுட்டுவது.	
	வினையியல்	
UNIT -V	வினை வகைப்பாடு(முழுமையும்)-கால விதிமுறைகளும் நேரக் கிளவியும்- எச்சம் என்ற சொல் -எச்ச வகைப்பாடு- எச்சங்களும் காலமும் -எது வினையடை -வினையெச்சங்கள் எல்லாம் வினையடைகளா -ஆக்கப் பெயர்கள்- தொழில் பெயர்கள்- வினையாலணையும் பெயர்கள்- துணைவினை- அமைப்பு முறை வகைப்பாடு -துணைவினை வகைப்பாடு - துணைவினையின் பண்புகள்- தனி வாக்கியம்- வாக்கியங்களின் பங்கு- வாக்கியம்- வாக்கிய உறுப்புக்கள்- பல்வேறு பொருள் தொடர்புகள்-வாக்கிய வகைகள்- தனி வாக்கியம், கலவை வாக்கியம்,கூட்டு வாக்கியம்- புதைநிலை, புறநிலை -பின் உருபுகள்.	18 CONTACT HOURS
	TOTAL LECTURE HOURS	**90**
	Text Book	
	ச. அகத்தியலிங்கம், தமிழ்மொழி அமைப்பியல், மெய்யப்பன் தமிழாய்வகம், சென்னை, 2002.	
	REFERENCE BOOKS	
	பொற்கோ, இக்காலத் தமிழ் இலக்கணம், பூம்பொழில் வெளியீடு, சென்னை, 2002.	
	கு. பரமசிவம், இக்காலத் தமிழ் மரபு, கழக வெளியீடு, சென்னை, 1991.	
	நுஃமான், எம். ஏ., அடிப்படைத் தமிழ் இலக்கணம், வாசகர் சங்கம், 1999	

WEB SOURCES
• Tamil virtual University Library- www.tamilvu.org/
• Project Madurai - www.projectmadurai.org.
• Chennai Library- www.chennailibrary.com http://www.chennailibrary.com>.
• Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.
• Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com
• Tamil Books on line- books.tamil cube.com
• Catalogue of the Tamil books in the Library of British Congress archive.org
• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	M	S
Co2	M	M	S	M	S
Co3	S	M	S	M	S
Co4	S	M	S	M	S
Co5	M	S	S	M	S

S-Strong; M-Medium; L-Low

தாள்-3 தமிழ்ப் பொருண்மையியல்

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
31T	PART-1 TAMIIL PAPER-111 தமிழ்ப் பொருண்மையியல்		Y	-	-	-	6	4	25	75	100

	CORE/ELECTIVE/SUPPORTIVE		SUPPORTIVE (பொதுத் தமிழ்ப் பாடத்திற்கு மாற்றாக)
PRE-REQUISITE		இளங்கலைப் பட்டக் கல்விக்குத் தமிழை முதன்மைப் பாடமாக எடுத்திருத்தல்.	

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- மொழிக்கல்வியில் பொருண்மையின் இடத்தை அறிதல்.
- தமிழ் மொழியின் சொற்களம், சொற்பொருள் உறவுகளை அறிதல்.
- பொருண்மையியல் கோட்பாடுகளைப் புரிந்து கொள்ளல்.
- பொருண்மையியல் அடிப்படையில் இலக்கியப் பனுவல்களை அணுகுதல்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	மொழிக்கல்வியில் பொருண்மையின் இன்றியமையாமையை உணர்வர்.	K1,k2
CO 2	சொல்- பொருள் உறவுகளை நுட்பமாக அறிந்து கொள்வர்.	K2,
CO 3	சொற்பொருள் மாற்ற வரலாறுகளைத் தெரிந்து கொள்வர்.	K2,k4
CO 4	பொருளடிப்படையில் ஆற்றல் வாய்ந்த முறையில் மொழியைக் கையாளும் திறன் பெறுவர்.	K5.k4
CO 5	மொழிசார்ந்த பல்வேறு பணிகளில் பொருண்மையியல் கூறுகளைப் பொருத்திக் காண்பர்.	K5,k6
K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE		

UNIT -I	பொருள்: வரையறை விளக்கம், சொன்மை-பொருண்மை; பொருண்மையியல்: விளக்கம், வகைகள், அணுகுமுறைகள்; ஆக்டன் மற்றும் ரிசார்ட் பொருண்மை முக்கோணம்.	18 contact hours
UNIT -II	பன்முனைப் பொருள்(Multiple meaning), பலபொருள் ஒரு சொல் (Polysemy), ஒரு சொல் போலியியல் (Homonymy), ஒரு பொருள் பன்மொழி (Synonymy), புலன் உறவு (Sense relation), பொருள் மயக்கம், உருவகம், ஆகுபெயர்	18 contact hours
UNIT -III	பொருண்மையியல் கோட்பாடுகள்: தொல்காப்பியம், சசூர், ஜான் லயன்ஸ், உல்மன், லீச், பூக்கோ, லகான்; மொழி பயன்பாட்டுச் சூழலியல் கோட்பாடுகள்.	18 contact hours
UNIT -IV	சொற்பொருள் மாற்றம் : பொருள் குறுக்கம், பொருள் விரிவாக்கம், இடக்கரடக்கல், மங்கல வழக்கு , அமங்கலவழக்கு, பொருள் அடங்குச் சொற்கள், பொருள் அடக்குச் சொற்கள்.	18 contact hours
UNIT -V	இலக்கியத்தில் குறிப்புப் பொருள் ; படிமம் , குறியீடு , இறைச்சி , உள்ளுறை , தொனிப் பொருள் , தொன்மங்களின் அடிநிலை கருத்து. இலக்கியத்தில் குறிப்புப் பொருள் ; படிமம் , குறியீடு , இறைச்சி , உள்ளுறை , தொனிப் பொருள் , தொன்மங்களின் அடிநிலை கருத்து.	18 contact hours
	Total Lecture Hours	90 Contact hours
	Reference Books	
	செ.சண்முகன், பொருண்மையியல், அனைத்திந்திய தமிழ் மொழியியல் கழகம், 1989 இ. முத்தையா, பொருண்மையியல் பயன்வழியியல் (Semantics and pragmatics) பரணி அச்சகம், மதுரை,1982	

	தமிழும் குறியியலும், தமிழவன், உலகத் தமிழாராய்ச்சி நிறுவனம், 1992.
	பொருண்மையியல், தொலைதூரக் கல்வி இயக்ககம், அண்ணாமலைப் பல்கலைக்கழகம்

WEB SOURCES
• Tamil virtual University Library- www.tamilvu.org/
• Project Madurai - www.projectmadurai.org.
• Chennai Library- www.chennailibrary.com http://www.chennailibrary.com>.
• Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.
• Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com
• Tamil Books on line- books.tamil cube.com
• Catalogue of the Tamil books in the Library of British Congress archive.org
• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	S	S
Co2	S	S	S	M	S
Co3	S	S	S	M	S
Co4	S	S	S	S	S
Co5	S	M	S	S	S

S-Strong; M-Medium; L-Low

தாள்-4 தமிழகக் கலைகள்

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
41T	PART-1 TAMIIL PAPER-1V தமிழகக் கலைகள்		Y	-	-	-	6	4	25	75	100

	CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE (பொதுத் தமிழ்ப் பாடத்திற்கு மாற்றாக)
PRE-REQUISITE	இளங்கலைப் பட்டக் கல்விக்குத் தமிழை முதன்மைப் பாடமாக எடுத்திருத்தல்.	

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- தமிழர்தம் கலைத்திறனை அறிமுகப் படுத்துதல்.
- இசை, நடனம், நாடகம், ஓவியம்,சிற்பம், கட்டடம் முதலிய கலைகளின் அடிப்படைகளை அறிவர்.
- தமிழக மரபுகளின் தனித் தன்மைகளை உணரச் செய்தல்.
- தமிழர் கலைகளின் வரலாற்றை உணரச் செய்தல்.
- கலைஞர்களின் வாழ்வியல் பின்புலன்களை அறிந்து கொள்ளல்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	தமிழகக் கலைகளின் அடிப்படைகளை தெரிந்து கொள்வர்.	K1,k2
CO 2	தமிழகக் கலை மரபுகளை அறிந்து கொள்வர்.	K2,
CO 3	கலைக் கூறுகளை இலக்கியம், பண்பாடு ஆகியவற்றோடு பொருத்திப் பார்ப்பர்.	K2,k4
CO 4	கலைநுட்பம் உணர்ந்து அவற்றின் சிறப்பைப் பாராட்டும் தகுதி பெறுவர்.	K5.k4
CO 5	அழி நிலையிலுள்ள கலைகளுக்குப் புத்தாக்கம் தருவதற்கான உந்துதல் பெறுவர்.	K5,k6

K1 - REMEMBER; K2 - UNDESTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE

UNIT -I	கலை – கலையும் பண்பாடும் – கலையும் இலக்கியமும் - நுண் கலைகள் – நிகழ்த்து கலைகள் – வேத்தியல் – பொதுவியல்	18 CONTACT HOURS
UNIT -II	இசைக் கலை – தமிழர் இசை – பண்ணிசை – அரங்கிசை – கீர்த்தனைகள் – திருப்புகழ் – நடனக் கலை – நாட்டியம் – அட(டை)வுகள் – முத்திரைகள் – ஒப்பனைக் கலை – அரங்க அமைப்பு - இசைக் கருவிகள்: தோற்கருவி – துளைக்கருவி – கஞ்சக் கருவி – வாய்ப்பாட்டு – நாடகக் கலை: கூத்து, மேடை, மூன்றாம் அரங்கம்	18 CONTACT HOURS
UNIT -III	ஓவியக் கலை – வண்ணக் கலவை – சிற்பக் கலை – வழிபாட்டுச் சிற்பங்கள், பொதுச் சிற்பங்கள் – கற்சிற்பங்கள் – உலோகச் சிற்பங்கள் – மரச் சிற்பங்கள்	18 CONTACT HOURS
UNIT -IV	கட்டடக் கலை – கட்டடப் பொருட்கள் – வீடு, இல்லம், கோயில் கட்டடங்கள் – ஆகமங்கள் – உடல் அமைப்பும் கோயில் கட்டட அமைப்பும் – கப்பல் கலை.	18 CONTACT HOURS
UNIT -V	கைவினைப் பொருள்கள்- புவிசார் குறியீடு பெற்ற தமிழக கலைப்பொருள்கள்-புழங்கு பொருட்கள் – புழங்கு பொருள் கலை – கலைஞர்கள்– கலைஞர்களின் வாழ்வியல்	18 CONTACT HOURS
	TOTAL LECTURE HOURS	**90**
	Text Book	
	தமிழகக் கலைகள் முனைவர் செ.ரவிசங்கர் வெளியீடு :நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட். சென்னை	
	REFERENCE BOOKS	

தமிழர் வளர்த்த அழகுக் கலைகள்
மயிலை சீனி.வேங்கடசாமி ,

கே.கே.பிள்ளை, தமிழக வரலாறும் மக்களும் பண்பாடும், உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2008.

இந்திரன், தமிழ் அழகியல், தாமரைச் செல்வி பதிப்பகம், 1993

மா.இராசமாணிக்கனார், தமிழகக் கலைகள், பாரிநிலையம், 1980

	துளசி ராமசாமி, தமிழகக் கலைச் செல்வங்கள், உலகத் தமிழாராய்ச்சி நிறுவனம், 1990	

WEB SOURCES
• Tamil virtual University Library- www.tamilvu.org/
• Project Madurai - www.projectmadurai.org.
• Chennai Library- www.chennailibrary.com http://www.chennailibrary.com>.
• Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.
• Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com
• Tamil Books on line- books.tamil cube.com
• Catalogue of the Tamil books in the Library of British Congress archive.org
• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	S	S
Co2	S	M	S	S	S
Co3	S	S	S	S	M
Co4	S	S	S	S	S
Co5	S	S	S	M	S

S-Strong; M-Medium; L-Low

PART -1 Tamil   பொதுத்தமிழ்

அனைத்து இளங்கலை பட்டப்படிப்பு (சிறப்புத் தமிழ் அல்லாத) மாணவர்களுக்கானது
(தமிழ்நாடு மாநில உயர்கல்வி மன்றப் பாடத்திட்டம் 2022 - யை அடியொற்றியது)

Syllabus

AFFILIATED COLLEGES

Program Code: ***

2025 – 2026onwards

BHARATHIAR UNIVERSITY

(AStateUniversity,Accreditedwith"A++" GradebyNAAC,

Ranked 21[st]amongIndianUniversitiesby MHRD-NIRF)

Coimbatore - 641 046, Tamil Nadu, India

Instruction : PEOs are:	
Program Educational Objectives (PEOs) **PART –I TAMIL program**	
PEO1	இலக்கியப் பார்வை பெறுதல்.
PEO2	காலந்தோறுமான இலக்கிய வகைகளை அறிதல்.
PEO3	இலக்கியச் சுவை உணர்வுவழி மனநல மேம்பாடு பெறுதல்.
PEO4	மொழிப் பயிற்சி வழி மொழியாளுமையைப் பெறுதல்.
PEO5	சமூகக் கண்ணோட்டத்தைப் பெறுதல்
PEO6	படைப்பாளுமையை மேம்படுத்துதல்.
PEO7	வாழ்வியல் கோட்பாடுகளை உணர்தல்.
PEO8	இலக்கிய வரலாறு வழி பண்பாடுகளை அறிதல்.
PEO9	நிறை மனத்தினராதல்.
PEO10	நூல்களைத் தேர்ந்து படிக்கும் பழக்கம் பெறுதலும் போட்டித் தேர்வுகளுக்குத் திறனுடையோராதலும்.

Program Specific Outcomes (PSOs)

After the successful completion of PART-1 program, the students are expected to	
PSO1	இலக்கியம் இன்னதென்பதை அறிதல். .
PSO2	இலக்கிய வடிவங்களை அறிதல்
PSO3	மொழிப் பயன்பாட்டு அறிவு பெறுதல்.
PSO4	சமூகச் சிந்தனை அறிவு பெறுதல்.
PSO5	படைப்பாளர்களாய் உருவாதல்.
PSO6	வாழ்வியல் மதிப்புகளைப் பெறுதல்
PSO7	பாரம்பரிய பண்பாட்டு உணர்வடைதல்
PSO8	மனநல மேம்பாட்டுடன் மிளிர்தல்
PSO9	நிறைவாழ்வு நடாத்துதல்.
PSO10	நூலின்பம் பெறுதலும்.பணிவாய்ப்பிற்கான தகுதி பெறுதலும்.

Program Outcomes (Pos)	
On successful completion of the PART-I Tamil Program	
PO1	பாடப்பகுதியிலக்கியங்கள் வழி மானுட மதிப்புகளைப் பெறுதல்.
PO2	சமூகத்தின் பாற்பட்ட நல்லுணர்வு பெறுதல்.
PO3	மொழியாளுமைத் திறன் உடையோராதல்.
P04	படைப்பாக்கத் திறன் பெற்றோராதல்.
P05	இலக்கிய வரலாறு வழி போட்டித் தேர்வுகளை எதிர் கொள்ளும் திறன் பெறுதல்.

BHARATHIAR UNIVERSITY: COIMBATORE 641 046
PART- 1 TAMIL CURRICULUM OTHER THEN TAMIL MAJOR (AFFILIATED COLLEGES)
FOLLOWED BY TANSCHE SYLLABUS- AUGUST-2022
(For the students admitted during the academic year 2025-2026 onwards)

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	INSTRUCTION HOURS	DURATION THE HOURS (EXAM)	MAXIMUM MARKS			CREDIT
					CIA	ESE	TOTAL	
I	11T	PART1 – TAMIL PAPER1I (Poetry, Short Story, Grammar, Translation and Communicative Skills, History of Tamil Literature)	6	3	25	75	100	4
II	21T	PART1 – TAMIL PAPER1I (Poetry, Prose,Grammar, Communicative Skills, History of Tamil Literature)	6	3	25	75	100	4
III	31T	PART1 – TAMIL PAPER1II (Poetry, Novel, Communicative Skills, History of Tamil Literature	6	3	25	75	100	4
IV	41T	PART1 – TAMIL PAPER1V (Poetry, Drama, Communicative Skills, History of Tamil Literature)	6	3	25	75	100	4

தாள்-1

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
11T	PART-1 TAMIIL PAPER-1		Y	-	-	-	6	4	25	75	100

CORE/ELECTIVE/SUPPORTIVE		SUPPORTIVE	
PRE-REQUISITE	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்.		

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ்மொழி இலக்கியங்களை அறிமுகம் செய்தல்.
- தற்கால இலக்கியப் போக்குகளையும் இலக்கண வளங்களையும் மாணவர் அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்.
- தமிழ் இலக்கியம் சார்ந்த போட்டித்தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	பாரதியார் காலந்தொட்டு தற்காலப் புதுக்கவிதைகள் வரை கவிதை இலக்கியம் அறிமுகப்படுத்தப்படுவதால் படைப்பாற்றல் திறன்பெறுதல்.	K1,K2
CO 2	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்.	K2
CO 3	சிறுகதை இலக்கியவகையினைக் கற்பதன் மூலம் படைப்பாக்கத் திறனைப் பெறுவர்.	K3,K6
CO 4	மொழியறிவோடு சிந்தனைத்திறன் அதிகரித்தல்.	K3,K5
CO 5	தமிழ்மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கவும் அறிந்து கொள்ளுதல்.	K2,K6
K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE		

	மரபுக்கவிதை	
UNIT -I	1.பெ. சுந்தரனார் – தமிழ்த் தெய்வ வணக்கம் (நீராரும்.......வாழ்த்துதுமே) 2.பாரதியார் – நாட்டு வணக்கம் 3.பாரதிதாசன் – சிறுத்தையே வெளியில் வா 4.கவிமணி – புத்தரும் சிறுவனும் 5.முடியரசன்- மொழியுணர்ச்சி(1,2,3) 6.பட்டுக்கோட்டை கல்யாணசுந்தரம்- விடுதலை 7.தமிழ்ஒளி– நெய்வேலி நாம் பெற்ற பேறு 8.சுரதா- இயற்கை	18 CONTACT HOURS
	புதுக்கவிதை	
UNIT -II	.1அப்துல்ரகுமான் – ஒப்பிலாத சமுதாயம் .2ஈரோடுதமிழன்பன்– நகைத்துளிப்பா(சென்ரியூ)* பா எண்29,41,53,65,89,92,94,118,139,168 இயைபுத் துளிப்பா (லிமரைக்கூ)** பா எண்1,20,59,91,110,112,118,124,129,135 *ஒரு வண்டி சென்ரியு **சென்னிமலைக் கிளியோப்பாத்ராக்கள் 3.சிற்பி பாலசுப்பிரமணியம்.- நழுவும் பருவம் .4தேனரசன் – கதறுகிறேன் 5.புவியரசு -தந்தை மகற்காற்றும் உதவி .6வைரமுத்து – மழைக்காலப் பூக்கள் 7.இளம்பிறை – அம்மா 8.தாமரை ஒரு -கதவும் கொஞ்சம் கள்ளிப்பாலும்	18 CONTACT HOURS
	சிறுகதைகள்	
UNIT -III	.1ஆற்றங்கரைப் பிள்ளையார்– புதுமைப்பித்தன் 2.முள்முடி – தி.ஜானகிராமன் 3.காகிதஉறவு – சு.சமுத்திரம் 4. கரு – உமாமகேஸ்வரி 5.வீட்டின் மூலையில் ஒரு சமையல் அறை – அம்பை 6.மாப்பளே இரயிலுப் பாக்கப் போலாமா...? - பட்சி (கொங்கு வட்டாரச் சிறுகதை)	18 CONTACT HOURS

	7.ஒரு ஸ்கூல் கோயிலாகிறது-மாத்தளை சோழு		
	8.நூலகத்தில் ஒரு தளபதி-இடாலோ கால்வினா		
	(மொழிபெயர்ப்புக்கதை, தமிழில்- மாதவன்)		

	சிறுகதைக் கொத்து வெளியீடு அறிவுப் பதிப்பகம்(பி)லிட் சென்னை-14	
UNIT -IV	பாடம் சார்ந்த இலக்கிய வரலாறு .1இருபதாம் நூற்றாண்டு மரபுக்கவிதைகள் .2புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் .3சிறுகதையின் தோற்றமும் வளர்ச்சியும்.; பாட நூல் தமிழ் இலக்கிய வரலாறு முனைவர் ப.இப்ராஹிம் வெளியீடு: நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட், சென்னை	18 CONTACT HOURS
UNIT -V	இலக்கணம் /மொழித்திறன் • பொருள் பொதிந்த சொற்றொடர் அமைத்தல் • ஓர் எழுத்து ஒரு மொழி • வேற்றுமை உருபுகள் • திணை, பால், எண், இடம் 2.மொழி பெயர்ப்பு-ஆங்கிலத்திலிருந்து தமிழ் அபொது நிலை. ஆஅலுவலக நிலை.	18 CONTACT HOURS
	TOTAL LECTURE HOURS	**90**
	REFERENCE BOOKS	
	தமிழ் இலக்கிய வரலாறு – சி.பாலசுப்பிரமணியன்	
	புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு–தமிழண்ணல்	
	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு- எஃப்.பாக்கியமேரி	

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• Catalogue of the Tamil books in the Library of British Congress archive.org •
• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	S	M
Co2	M	S	S	S	S
Co3	S	S	S	S	M
Co4	S	S	S	S	S
Co5	M	M	S	S	S

S-Strong; M-Medium; L-Low

பகுதி1-பொதுத் தமிழ்
தாள்-1
மொத்த மதிப்பெண்கள்-100
பல்கலைக் கழக வினாத்தாள் அமைப்பு முறை

கால அளவு - 3மணி நேரம்   மொத்த மதிப்பெண்கள் - 75

வ.எ	பிரிவு	மதிப்பெண்
1	பிரிவு -அ சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக.	10×1=10
2	பிரிவு -ஆ இரு பக்க அளவில் விடை தருக. செய்யுள் -2 வினாக்கள் சிறுகதை -2 வினாக்கள் அலகு 4 -1 வினா (அலகு 4 பகுதியில் அமையும்1 வினா பொருத்துக முறையில் ஐந்து சிறு தொடர்களாக தருக்கமுறையிலான வினா வடிவில் அமைய வேண்டும்)	5×5=25
3	பிரிவு -இ கட்டுரை வடிவில் விடை தருக. செய்யுள் - 2 வினாக்கள் சிறுகதை - 1 வினா இலக்கிய வரலாறு - 1 வினா பயிற்சி: மொழிபெயர்ப்பு - 1 வினா	5×8=40

குறிப்பு:

1)'அ' பிரிவில் ஒவ்வொரு அலகிலிருந்தும் இரண்டு வினாக்கள் இடம்பெற வேண்டும்.

2)'ஆ மற்றும் இ' பிரிவுகளில் வினாக்கள் 'இது அல்லது அது' என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைய வேண்டும்.

அகமதிப்பீட்டுத் தேர்வு மதிப்பெண் பிரிப்பு முறை
மொத்த மதிப்பெண் - 25
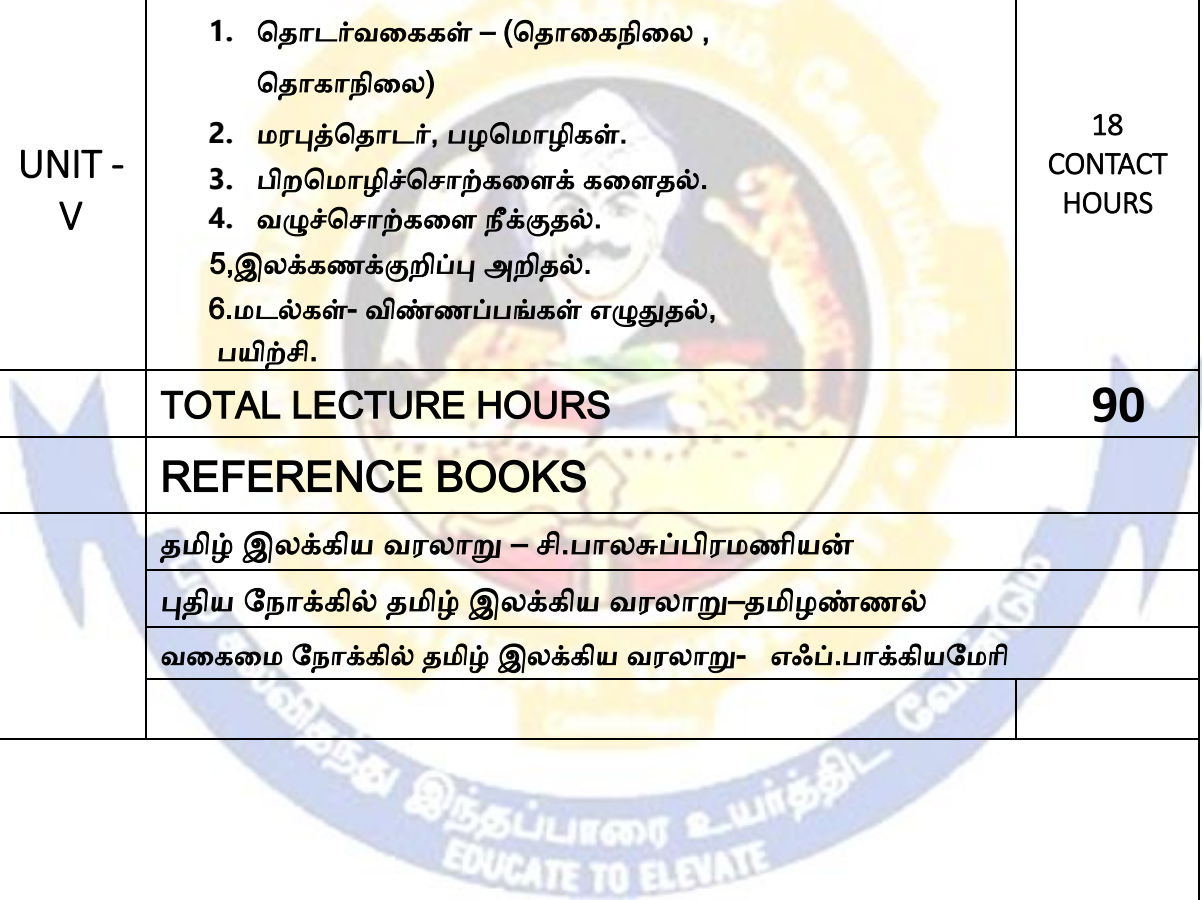
வ.எண்	பிரிவு	மதிப்பெண்
1	அகமதிப்பீட்டுத் தேர்வு – 1,11	10
2	மாதிரித் தேர்வு	10
3	ஒப்படைப்பு	5

தாள்-2

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
21T	PART-1 TAMIIL PAPER-11		Y	-	-	-	6	4	25	75	100

	CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE

PRE-REQUISITE	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்.

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- வாழ்வியல் அறஉணர்வை மேம்படுத்துதல்.
- சமய இலக்கியங்களையும் சிற்றிலக்கியங்களையும் மாணவர்களுக்கு அறிமுகப்படுத்துதல்.
- மொழித்திறனையும்,உரைநடை இலக்கிய வடிவம் வழியாக சமூகம் சார் சிந்தனை உணர்வையும் பெறுவர்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	அற உணர்வின் பாற்பட்டு தமது வாழ்வை நடத்தும் திறம் பெறுவர்.	k2,K3
CO 2	சிற்றிலக்கியங்களின் வழி இலக்கியச் சுவையினையும் பண்பாட்டு அறிவினையும் பெறுவர். பக்தி இலக்கியம் வழி பக்குவ மனப்பாங்கும் சித்தர் இலக்கியவழி சிந்தனை தெளிவும் பெறுவர்.	K1,K2,
CO 3	உரைநடை இலக்கியங்கள் வழி சமூக உணர்வு, வாழ்வியல் அற விழிப்புணர்வு மற்றும் மொழிசார் கருத்துக்களைப் பெறுவர்.	K2,k4
CO 4	தமிழ்ச் சமூகப்பண்பாட்டு வரலாற்றினை இலக்கியங்கள் வாயிலாக அறிவர்.	K5.k4
CO 5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்கு ஏற்ப தமிழ்ப் பாடத்தினைப் பயன் கொள்ளும் வகையில் பயிற்சி பெறுவர்.விண்ணப்பங்கள் எழுதும் திறன் பெறுவர்.	K5,k6

K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 – CREATE

	அற இலக்கியம்- பக்தி இலக்கியம்	
UNIT -I	1.திருக்குறள் - அறன் வலியுறுத்தல்	18 CONTACT HOURS
	2.நாலடியார் - மெய்ம்மை	
	3.தேவாரம்-திருநாவுக்கரசர் –நின்ற திருத்தாண்டகம் முதல் 5 பாடல்கள்	
	.4பராபரக்கண்ணி- குணங்குடி மஸ்தான் சாகிபு பாடல்கள் 2 0 கண்ணிகள்	
	5. பிள்ளைச் சிறு விண்ணப்பம்- வள்ளலார் 1-5பாடல்கள்	
	சிற்றிலக்கியம்- சித்தர்பாடல்கள்- சிலேடைப் பாடல்கள்	
UNIT -II	1.திருக்குற்றாலக் குறவஞ்சி – குறத்தி மலைவளம் கூறுதல்.	18 CONTACT HOURS
	2.முக்கூடற்பள்ளு – நகர் வளம்	
	3. திருமந்திரம் – அன்புடைமை- (முதல் (பாடல்கள் 5. 4பட்டினத்தார் பாடல்கள்)-திருவேகம்பமாலை -பாடல் எண்11முதல்15வரை)	
	5.கவி வீரராகவர் – 1வைக்கோலுக்கும் யானைக்கும்.... 2முகுந்தனுக்கும் முறத்திற்கும்.... 3சந்திரனுக்கும் மலைக்கும்....	
	உரைநடை	
UNIT -III	1.தமிழ்நாடு-திரு.வி.க.	18 CONTACT HOURS
	2. வீரக்கல்-ரா.பி .சேதுப்பிள்ளை.	
	3.எளிமை ஓர் அறம் - மு.வ.	
	4.தமிழில் அறிவியல் - மணவை முஸ்தபா	
	5. தமிழ்வழிக் கல்வி குறித்த ஒரு விளக்கக் கருத்துரை - மூலம் தமிழண்ணல் மொழியாக்கம் -முனைவர் க. முத்தையா	
	6. தமிழ் கற்றல் கற்பித்தல்:சமுதாய மொழியியல் நோக்கில் – டாக்டர் கி.கருணாகரன்.	
	7. குழந்தைகளும் இலக்கியமும் - டாக்டர் பூவண்ணன்	
	8. ஓதுவது ஒழியேல் - முனைவர் சி.பாலசுப்ரமணியன்	
	உரைநடைத் திரட்டு வெளியீடு:தாமரை பப்ளிகேஷன்ஸ் சென்னை-50	

UNIT - IV	**பாடம் சார்ந்த இலக்கிய வரலாறு**		18 CONTACT HOURS
	1.பதினென்கீழ்க்கணக்கு நூல்கள்.		
	2.பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்.		
	3.சிற்றிலக்கிய வகைகள்.		
	4.உரைநடையின் தோற்றமும் வளர்ச்சியும்.		
	பாட நூல் தமிழ் இலக்கிய வரலாறு முனைவர் ப.இப்ராஹிம் வெளியீடு: நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட், சென்னை		
UNIT - V	**இலக்கணம் /மொழித்திறன்**		18 CONTACT HOURS
	இலக்கணம்/மொழித்திறன்/போட்டித்தேர்வுத்திறன் 1. தொடர்வகைகள் – (தொகைநிலை , தொகாநிலை) 2. மரபுத்தொடர், பழமொழிகள். 3. பிறமொழிச்சொற்களைக் களைதல். 4. வழுச்சொற்களை நீக்குதல். 5,இலக்கணக்குறிப்பு அறிதல். 6.மடல்கள்- விண்ணப்பங்கள் எழுதுதல், பயிற்சி.		
TOTAL LECTURE HOURS			**90**
REFERENCE BOOKS			
	தமிழ் இலக்கிய வரலாறு – சி.பாலசுப்பிரமணியன்		
	புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு–தமிழண்ணல்		
	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு- எஃப்.பாக்கியமேரி		

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• Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	M	S
Co2	S	S	S	M	S
Co3	S	S	S	S	S
Co4	M	S	S	S	S
Co5	M	S	S	S	S

S-Strong; M-Medium; L-Low

பகுதி1-பொதுத் தமிழ்
தாள்-2
மொத்த மதிப்பெண்கள்-100
பல்கலைக் கழக வினாத்தாள் அமைப்பு முறை

கால அளவு - 3மணி நேரம்   மொத்த மதிப்பெண்கள் - 75

வ.எ	பிரிவு	மதிப்பெண்
1	**பிரிவு -அ** சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக	10×1=10
2	**பிரிவு -ஆ** இரு பக்க அளவில் விடை தருக. செய்யுள் -2 வினாக்கள் உரைநடை -2 வினாக்கள் அலகு 4 -1 வினா (அலகு 4 பகுதியில் அமையும்1 வினா பொருத்துக முறையில் ஐந்து சிறு தொடர்களாக தருக்கமுறையிலான வினா வடிவில் அமைய வேண்டும்)	5×5=25
3	**பிரிவு -இ** கட்டுரை வடிவில் விடை தருக. செய்யுள் - 2 வினாக்கள் உரைநடை - 1 வினா இலக்கிய வரலாறு - 1 வினா பயிற்சி:விண்ணப்பங்கள் - 1 வினா	5×8=40

குறிப்பு:

1)'அ' பிரிவில் ஒவ்வொரு அலகிலிருந்தும் இரண்டு வினாக்கள் இடம்பெற வேண்டும்.

2)'ஆ மற்றும் இ' பிரிவுகளில் வினாக்கள் 'இது அல்லது அது' என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைய வேண்டும்.

அகமதிப்பீட்டுத் தேர்வு மதிப்பெண் பிரிப்பு முறை

மொத்த மதிப்பெண் - 25

வ.எண்	பிரிவு	மதிப்பெண்
1	அகமதிப்பீட்டுத் தேர்வு – 1,11	10
2	மாதிரித் தேர்வு	10
3	ஒப்படைப்பு	5

தாள்-3

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
31T	PART-1 TAMIIL PAPER-111		Y	-	-	-	6	4	25	75	100

CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE

PRE-REQUISITE	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்.

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- இரண்டாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ்மொழி இலக்கியங்களை அறிமுகம் செய்தல்.இலக்கியங்களின்சிறப்பினைஉணர்த்துதல்.
- காலந்தோறும் எழுந்த காப்பியங்களின் போக்கையும், புதினத்தின் இலக்கிய வடிவத்தையும், யாப்பு, அணி போன்ற இலக்கியவகைகளையும் மாணவர்கள் உணருமாறு செய்தல்.
- தமிழ் இலக்கியம் சார்ந்த போட்டித்தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	காப்பியங்கள் அறிமுகப்படுத்தப்படுவதால் தமிழ்மொழியின் உயர்வையும் சிறப்பையும் உணர்தல்.	K1,K2
CO 2	சமயக் காப்பியங்களின் வழி சமூக நல்லுணர்வுச் சிந்தனையைப் பெறுவர்.	K2,K4
CO 3	தமிழ்ப் புதினங்களின் சமகாலப்படைப்புகள் காட்டும் வாழ்வியலை அறிந்து கொள்வர்.	K3,K6
CO 4	நாவல் இலக்கியம் அறிமுகப்படுத்தப்படுவதால் சிந்தனைஆற்றல், படைப்பாற்றல்,கற்பனைத்திறன்வளர்தல்.	K3,K5
CO 5	யாப்பு, அணிஇலக்கணங்கள், கட்டுரை எழுதுதல் ஆகியவற்றைக் கற்பதன் மூலம் போட்டித்தேர்வுகளை எதிர் கொள்ளும் திறன் பெறுவர்.	K2,K6

K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE

	பெருங்காப்பியங்கள்	
UNIT -I	சிலப்பதிகாரம்–மங்கலவாழ்த்துப்பாடல்-இளங்கோவடிகள்	18 CONTACT HOURS
	மணிமேகலை -சிறைக் கோட்டம் அறக் கோட்டமாக்கிய காதை - சீத்தலைச்சாத்தனார்	
	சீவகசிந்தாமணி - நாமகள்இலம்பகம்- (பாடல் எண் -30 70)திருத்தக்கதேவர்	
	சமய இலக்கியங்கள்	
UNIT -II	பெரியபுராணம்–திருநீலகண்டநாயனார்புராணம்- சேக்கிழார்	18 CONTACT HOURS
	கம்பராமாயணம் –கங்கைப் படலம் (1-27)-கம்பர்	
	தேம்பாவணி – நாட்டுப்படலம்-வீரமாமுனிவர் (பாடல் எண் 14-45)	
Unit –III	புதினம்	18 CONTACT HOURS
	ஆத்மாவின் ராகங்கள்- நா. பார்த்தசாரதி சமூகப் புதினம் பாவை பப்ளிகேஷன்ஸ் சென்னை-14	
	பாடம் சார்ந்த இலக்கிய வரலாறு	
UNIT -IV	1.ஐம்பெருங்காப்பியங்கள்	18 CONTACT HOURS
	2.ஐஞ்சிறுங்காப்பியங்கள்	
	.3புதினத்தின்தோற்றமும்வளர்ச்சியும்	
	பாட நூல் தமிழ் இலக்கிய வரலாறு முனைவர் ப.இப்ராஹிம் வெளியீடு: நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட், சென்னை	
UNIT -V	இலக்கணம் /மொழித்திறன்	18 CONTACT HOURS
	1.பாவகைகள் - வெண்பா, ஆசிரியப்பா	
	2.அணிகள் - உவமை, உருவகம்	
	.3கட்டுரை எழுதுதல் அஇலக்கியக். கட்டுரைகள் ஆஅறிவியல் கட்டுரைகள்.	
	TOTAL LECTURE HOURS	**90**

	REFERENCE BOOKS	
	தமிழ் இலக்கிய வரலாறு – சி.பாலசுப்பிரமணியன்	
	புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு–தமிழண்ணல்	
	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு- எஃப்.பாக்கியமேரி	

WEB SOURCES

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- Project Madurai - www.projectmadurai.org.
- Chennai Library- www.chennailibrary.com <http://www.chennailibrary.com>.
- Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.
- Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com
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- Tamil novels on line - books.tamilcube.com

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	M	S
Co2	S	S	S	M	S
Co3	S	S	S	S	S
Co4	M	S	S	S	S
Co5	M	S	S	S	S

S-Strong; M-Medium; L-Low

பகுதி1-பொதுத் தமிழ்

தாள்-3
மொத்த மதிப்பெண்-100
பல்கலைக் கழக வினாத்தாள் அமைப்பு முறை

கால அளவு - 3மணி நேரம்   மொத்த மதிப்பெண்கள் - 75

வ.எ	பிரிவு	மதிப்பெண்
1	**பிரிவு -அ** சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக	10×1=10
2	**பிரிவு -ஆ** இரு பக்க அளவில் விடை தருக. செய்யுள் -2 வினாக்கள் புதினம் -2 வினாக்கள் அலகு 4 -1 வினா (அலகு 4 பகுதியில் அமையும்1 வினா பொருத்துக முறையில் ஐந்து சிறு தொடர்களாக தருக்கமுறையிலான வினா வடிவில் அமைய வேண்டும்)	5×5=25
3	**பிரிவு -இ** கட்டுரை வடிவில் விடை தருக. செய்யுள் - 2 வினாக்கள் புதினம் - 1 வினா இலக்கிய வரலாறு - 1 வினா பயிற்சி: கட்டுரை - 1 வினா	5×8=40

குறிப்பு:1)'அ' பிரிவில் ஒவ்வொரு அலகிலிருந்தும் இரண்டு வினாக்கள் இடம்பெற வேண்டும்.2)'ஆ மற்றும் இ' பிரிவுகளில் வினாக்கள் 'இது அல்லது அது' என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைய வேண்டும்.

அகமதிப்பீட்டுத் தேர்வு மதிப்பெண் பிரிப்பு முறை
மொத்த மதிப்பெண் -25

வ.எண்	பிரிவு	மதிப்பெண்
1	அகமதிப்பீட்டுத் தேர்வு – 1,11	10
2	மாதிரித் தேர்வு	10
3	ஒப்படைப்பு	5

தாள்-4

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	S	INSTRUCTION HOURS	CREDITS	MARKS		
									CIA	EXTERNAL	TOTAL
41 T	PART-1 TAMIIL PAPER-1V		Y	-	-	-	6	4	25	75	100

CORE/ELECTIVE/SUPPORTIVE	SUPPORTIVE

PRE-REQUISITE	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்.

LEARNING OBJECTIVES

THE MAIN OBJECTIVES OF THIS COURSE ARE TO :

- செவ்வியல் இலக்கியமாம் சங்க இலக்கியங்களின் சிறப்பினை உணர்த்துதல்.
- சங்க இலக்கியத்தின் சிறப்பையும், நாடகம் என்னும் இலக்கியவகையின் தன்மையையும் அகத்திணை, புறத்திணை இலக்கணங்களையும் மாணவர்களுக்கு அறிமுகப்படுத்துதல்.
- தமிழ்இலக்கியம் சார்ந்த போட்டித்தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்.

EXPECTED COURSE OUTCOMES

ON THE SUCCESSFUL COMPLETION OF THE COURSE, STUDENTS WILL BE ABLE TO

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்.

CO 1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்.	k2,K3
CO 2	தமிழின் தொன்மையையும், செம்மொழித் தகுதியையும் அறிந்து கொள்ளுதல்.	K1,K2,
CO 3	நாடக இலக்கியம் மூலம் நடிப்பாற்றலையும், கலைத் தன்மையையும், படைப்பாற்றலையும் வளர்த்தல்.	K2,k4
CO 4	மானுட விழுமியங்களை உணர்த்துதல்.	K5.k4
CO 5	மொழியறிவோடு வேலை வாய்ப்பினைப் பெறுதல்.	K5,k6

K1 - REMEMBER; K2 - UNDERSTAND; K3 - APPLY; K4 - ANALYZE; K5 - EVALUATE; K6 - CREATE

	எட்டுத்தொகை	
UNIT -I	நற்றிணை (பாடல்எண் :9, 14, 18)	18 CONTACT HOURS
	குறுந்தொகை (பாடல்எண் :16, 17, 19, 20, 25, 29, 38, 341)	
	கலித்தொகை (பாடல்எண் :38, 51)	
	அகநானூறு(பாடல்எண்)14, 33, 55)	
	புறநானூறு (பாடல்எண் :(37, 86, 112,)	
	பரிபாடல் - செவ்வேள் (5)	
UNIT -II	பத்துப்பாட்டு நெடுநல்வாடை-நக்கீரர் (முழுமையும்)	18 CONTACT HOURS
	நாடகம்	
UNIT -III	ஆதி அத்தி ஆசிரியர்-ம.ப.பெரியசாமித் தூரன் (வரலாற்று நாடகம்)	18 CONTACT HOURS
	வெளியீடு: நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட், சென்னை-50	
UNIT -IV	பாடம் சார்ந்த இலக்கிய வரலாறு	18 CONTACT HOURS
	.1எட்டுத்தொகைநூல்கள்	
	2.பத்துப்பாட்டுநூல்கள்	
	.3நாடகத்தின்தோற்றமும்வளர்ச்சியும்	
	பாட நூல் தமிழ் இலக்கிய வரலாறு முனைவர் ப.இப்ராஹிம் வெளியீடு: நியூசெஞ்சுரிபுக்ஹவுஸ் (பி) லிட், சென்னை	

	இலக்கணம் /மொழித்திறன்	
UNIT -V	1. அகப்பொருள் (திணைகள்மட்டும்)	18 CONTACT HOURS
	.2புறப்பொருள் (திணைகள்மட்டும்)	
	.3படைப்பாக்கப் பயிற்சி (கவிதை,சிறுகதை)	
	TOTAL LECTURE HOURS	**90**
	REFERENCE BOOKS	
	தமிழ் இலக்கிய வரலாறு – சி.பாலசுப்பிரமணியன்	
	புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு–தமிழண்ணல்	
	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு- எஃப்.பாக்கியமேரி	

WEB SOURCES
• **Tamil virtual University Library- www.tamilvu.org/**
• **Project Madurai - www.projectmadurai.org.**
• **Chennai Library- www.chennailibrary.com <http://www.chennailibrary.com>.**
• **Tamil Universal Digital Library- www.ulib.prg <http://www.ulib.prg>.**
• **Tamil E-Books Downloads- tamilebooksdownloads. blogspot.com**
• **Tamil Books on line- books.tamil cube.com**
• **Catalogue of the Tamil books in the Library of British Congress archive.org** •
• **Tamil novels on line - books.tamilcube.com**

Mapping with Programme Outcomes

COs	Po1	Po2	Po3	Po4	Po5
Co1	S	S	S	S	M
Co2	M	S	S	S	S
Co3	S	S	S	S	M
Co4	S	S	S	S	S
Co5	M	M	S	S	S

S-Strong; M-Medium; L-Low

தாள்-4
மொத்த மதிப்பெண்கள்-100
பல்கலைக் கழக வினாத்தாள் அமைப்பு முறை

கால அளவு - 3மணி நேரம்   மொத்த மதிப்பெண்கள் - 75

வ.எ	பிரிவு	மதிப்பெண்
1	**பிரிவு -அ** சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக	10×1=10
2	**பிரிவு -ஆ** இரு பக்க அளவில் விடை தருக. செய்யுள் -2 வினாக்கள் நாடகம் -2 வினாக்கள் அலகு 4 -1 வினா (அலகு 4 பகுதியில் அமையும்1 வினா பொருத்துக முறையில் ஐந்து சிறு தொடர்களாக தருக்கமுறையிலான வினா வடிவில் அமைய வேண்டும்)	5×5=25
3	**பிரிவு -இ** கட்டுரை வடிவில் விடை தருக. செய்யுள் - 2 வினாக்கள் நாடகம் - 1 வினா இலக்கிய வரலாறு - 1 வினா பயிற்சி: படைப்பாக்கம் - 1 வினா	5×8=40

குறிப்பு:

1)'அ' பிரிவில் ஒவ்வொரு அலகிலிருந்தும் இரண்டு வினாக்கள் இடம்பெற வேண்டும்.

2)'ஆ மற்றும் இ' பிரிவுகளில் வினாக்கள் 'இது அல்லது அது' என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைய வேண்டும்.

அகமதிப்பீட்டுத் தேர்வு மதிப்பெண் பிரிப்பு முறை
மொத்த மதிப்பெண் - 25

வ.எண்	பிரிவு	மதிப்பெண்
1	அகமதிப்பீட்டுத் தேர்வு – 1,11	**10**
2	மாதிரித் தேர்வு	10
3	ஒப்படைப்பு	5

Program Educational Objectives (PEOs)	
The **Part II English** program will enable the students to	
PEO1	To develop the language skills of students by offering adequate practice in professional contexts
PEO2	Enhance the lexical, grammatical, socio-linguistic and communicative competence of students
PEO3	Develop strategic competence that will help to efficient communication.
PEO4	Provide the most pedagogical inputs for the students
PEO5	Instill a comprehensive understanding through the study of various analytical skills and advances the level of writing.
PEO6	Inculcate effective use of English in creative expression and day to day life.
PEO7	Enhance the ability to think and write critically and clearly.
PEO8	Prepare the students to use English proficiency in every day life and to lay foundation for compete in respective careers.

Program Specific Outcomes (PSOs)	
After the successful completion of Part II English program, the students are expected	
PSO1	To create a life-long interest to improve their language and communicative skills
PSO2	To develop the language skills through LSRW
PSO3	To improve the effectiveness in day to day communication
PSO4	To analyse various oral and written communication and proper responses
PSO5	To present their ideas in a suitable way for the given situation
PSO6	To assess and improve their communicative competency
PSO7	To apply knowledge in analyzing the text and context
PSO8	To prove their knowledge and skills in language proficiency
PSO9	To imbibe self-confidence through their language proficiency
PSO10	To enhance their communicative skills in their career

Program Outcomes (POs)	
On successful completion of the Part II English programme, students will be able to	
PO1	Prove their knowledge and skills in Language proficiency
PO2	Prove his proficiency in Listening Speaking Reading Writing.
PO3	Apply the knowledge in analyzing the text.
PO4	Develop good communicative skills
PO5	Demonstrate the competency in the domain area
PO6	Assess the communicative ideas
PO7	Establish a communicative competence in personal and social circumstances
PO8	Imbibe better understanding in various texts
PO9	Express thoughts, ideas and feelings appropriately in formal and informal communication
PO10	Evaluate every text and improve knowledge in various fields.

Course code	12E	PART II – ENGLISH-I	L	T	P	C
PART II ENGLISH		COMMUNICATIVE ENGLISH	4	-	-	4
Pre-requisite		**Basic knowledge of English language**	**Syllabus Version**		2020-2021	

Course Objectives:
The main objective of this course is to:
1. Enable the students to communicate effectively and appropriate in day-today conversations.

Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	To understand basic language skills through listening and reading	K1
2	To understand basic English grammar and use effectively	K2, K3
3	To enhance word power to speak and write effectively	K3
4	To improve flawless writing and speaking in day to day situations	K4
5	To communicate effectively	K5
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Unit:1		-		**20hours**

1. Listening and Speaking - Introducing self and others -Listening for specific information Pronunciation (without phonetic symbols) -Essentials of pronunciation - American andBritish pronunciation
2. Reading and Writing -Reading short articles – newspaper reports / fact based articles i. Skimming and scanning ii. Diction and tone - iii. Identifying topic sentences Reading aloud: Reading an article/report - Journal (Diary) Writing
3. Study Skills - 1
   a. Using dictionaries, encyclopaedias, thesaurus
4. Grammar in Context: Naming and Describing • Nouns & Pronouns •Adjectives

Unit:2	-	**20hours**

1. LISTENING AND SPEAKING –
a. Listening with a Purpose -b. Effective Listening
c. Tonal Variation d. Listening for Information e. Asking for Information f. Giving Information and Writing 1. a. Strategies of Reading: Skimming and Scanning b. Types of Reading: Extensive and Intensive Reading c. Reading a prose passage d. Reading a poem e. Reading a short story
2.Paragraphs: Structure and Types
a. What is a Paragraph? b. Paragraph structure c. Topic Sentence
d. Unity e. Coherence f. Connections between Ideas: Using Transitional words and expressions g. Types of Paragraphs
3. Study Skills II:
Using the Internet as a Resource a. Online search b. Know the keyword of India c. Refine your search d. Guidelines for using the Resources e. e-learning resources of Government f. Terms to know
4. Grammar in Context Involving Action-I a. Verbs b. Concord

Unit:3		**15hours**

1. Listening and Speaking -Giving and following instructions -Asking for and giving directions
-Continuing discussions with connecting
ideas
2. Reading and writing -Reading feature articles (from newspapers and magazines) -Reading to
identify point of view and perspective (opinion pieces, editorials etc.) -Descriptive writing –
writing a short descriptive essay of two to three paragraphs.
3. Grammar in Context:-Involving Action :Verbals - Gerund, Participle, Infinitive • Modals

Unit:4	-	**16 hours**

1. Listening and Speaking- a. Giving and responding toopinions
2. Reading and writing a. Note taking b. Narrative writing – writing narrative essays of two tothree
paragraphs
3. Grammar in Context: Tense • Present •Past • Future

Unit:5		**18 hours**

1. Listening and Speaking
a. Participating in a Group Discussion
2. Reading and writing -
Reading diagrammatic information - interpretations maps, graphs and
pie charts - Writing short essays using the
language of comparison and
contrast
3.Grammar in Context:
Voice (showing therelationship between Tense and Voice)

Unit:6	Contemporary Issues	2 hours
	Total Lecture hours	75hours

Text Book(s)

COMMUNICATIVE ENGLISH –TANSCHE

Reference Books

1	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://onlinecourses.nptel.ac.in/noc20_hs14/preview

Course Designed By:

COS	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	S	S	L	M	M	L	L	M	S	M
CO 2	L	S	S	S	M	M	M	M	L	M
CO 3	M	S	S	M	S	S	M	L	M	M
CO 4	M	M	S	S	S	S	S	L	M	S
CO 5	S	S	M	S	S	S	S	L	S	M

*S-Strong; M-Medium; L-Low

Course code	22E	PART II – ENGLISH-II	L	T	P	C
Part II English II		**COMMUNICATIVE ENGLISH**	**4**	**-**	**-**	**4**
Pre-requisite		**BASIC INTELLIGENCE ON WRITING**	**Syllabu s Version**		2020-2021	

Course Objectives:

The main objective of this course is to:

1. To train the students to develop the communication skills and inculcate language skills.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	Understand basic grammar and enrich word power and language skill	K1, K2
2	Enhance the writing skill of the students to write flawlessly	K3
3	Write paragraphs, emails, letters, opinion pieces and dramatic scripts	K4
4	Enhance understanding various formal and informal, written and oral communications and respond to them	K5
5	Generate the own writing.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit:1		**18hours**

1. Listening and Speaking
a. Listening and responding to complaints (formal situation) b. Listening to problems and offering solutions (informal)
2. Reading and writing
a. Reading aloud (brief motivational anecdotes) b. Writing a paragraph on a proverbial expression/motivational idea.
3. Word Power/Vocabulary
a. Synonyms & Antonyms
4. Grammar in Context
a. Adverbs b. Prepositions

Unit:2		**20hours**

1. Listening and Speaking
a. Listening to famous speeches and poems b. Making short speeches- Formal: welcome speech and vote of thanks. Informal occasions- Farewell party, graduation speech
2. Reading and Writing
a. Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic) b. Reading poetry b.i. Reading aloud: (Intonation and Voice Modulation) b.ii. Identifying and using figures of speech - simile, metaphor, personification etc.
3. Word Power
a. Idioms & Phrases

4. Grammar in Context a. Conjunctions and Interjections		
Unit:3		**18hours**
1. Listening and Speaking a. Listening to Ted talks b. Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds c. Interactions during and after the presentations 2. Reading and writing a. Writing emails of complaint b. Reading aloud famous speeches 3. Word Power a. One Word Substitution 4. Grammar in Context a. Sentence Patterns		
Unit:4		**16hours**
1. Listening and Speaking a. Participating in a meeting: face to face and online b. Listening with courtesy and adding ideas and giving opinions during the meeting and making concluding remarks. 2. Reading and Writing a. Reading visual texts – advertisements b. Preparing first drafts of short assignments 3. Word Power a. Denotation and Connotation 4. Grammar in Context: a. Sentence Types		
Unit:5		**18 hours**

1. Listening and Speaking
    a. Informal interview for feature writing b. Listening and responding to questions at a formal interview
    2. Reading and Writing
    a. Writing letters of application b. Readers' Theatre (Script Reading) c. Dramatizing everyday situations/social issues through skits. (writing scripts and performing)
    3. Word Power
    a. Collocation
    4. Grammar in Context
    a. Working with Clauses		

	Total Lecture hours	**90hours**
Text Book(s)		
1	COMMUNICATIVE ENGLISH –TANSCHE	
Reference Books		

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.coursera.org/specializations/academic-english
2	https://inhomelandsecurity.com/writing-thinking-intelligence-analysts/

COS	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	S	S	L	M	M	L	L	M	S	M
CO 2	L	S	S	S	M	M	M	M	L	M
CO 3	M	S	S	M	S	S	M	L	M	M
CO 4	M	M	S	S	S	S	S	L	M	S
CO 5	S	S	M	S	S	S	S	L	S	M

*S-Strong; M-Medium; L-Low

Course code	32E	PART II – ENGLISH-III	L	T	P	C
Part II English III			4	-	-	4
Pre-requisite		**EXPRESS IDEAS IN SIMPLE ENGLISH**	**Syllabus Version**		2020-2021	

Course Objectives:

The main objectives of this course are to:
1. To evolve students intellectual, personal and professionalabilities.
2. To develop interest inreading.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	Enhance the reading skill of the students.	K1
2	Understand the essence of literature.	K2
3	Improve the writing skills and present ideas appropriately	K3
4	Comprehend and interpret the text.	K4
5	Comment on the literary works efficiently.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit:1	**POETRY**	**15hours**

1. Ulysses – AlfredTennyson
2. Captain! My Captain! – WaltWhitman
3. The Unknown Citizen –W.H.Auden.

Unit:2	**PROSE**	**15hours**

3. Sweet for Angels –R.K.Narayan
4. My Lost Dollar – StephenLeacock
5. The Loss of the Titanic – LawrenceBeesley

Unit:3	**SHORT STORIES**	**15hours**

9. Orpheus and Eurydice – Rev.G.W.Cox
10. At the Church Door – Guy DeMaupassant
11. How much Land does a Man need? – LeoTolstoy

Unit:4	AUTOBIOGRAPHY	15hours

5. My Experiments with Truth -M.K.Gandhi
6. I am Malala – Malala

Unit:5	GRAMMAR AND COMPOSITION	13 hours

7. Modals
8. Concord
9. DialogueWriting
10. E-Mail
11. ReportWriting

Unit:6	Contemporary Issues	2 hours

	Total Lecture hours	75hours

Text Book(s)

1	Dew drops- Publishers: New Century Book House(p)Ltd.,

Reference Books

1	High school English Grammar and composition by WREN & MARTIN

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://www.fluentu.com/blog/english/english-writing-practice/
2	https://www.readandspell.com/how-to-improve-writing-skills-in-English

Course Designed By:

Mapping with Programme Outcomes										
COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0
CO1	S	M	M	S	S	S	S	S	S	L
CO2	L	S	S	S	S	S	S	S	S	S
CO3	M	S	S	S	S	S	S	S	S	S
CO4	M	M	S	S	S	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	42E	PART II – ENGLISH-IV	L	T	P	C
Part II English IV			**4**	**-**	**-**	**4**
Pre-requisite		Knowledge on basic English Skills	**Syllabus Version**		2020-2021	

Course Objectives:
The main objective of this course is to:
1. Enable the students to incorporate the language skills (Listening, speaking, reading & writing) in day today conversations.

Expected Course Outcomes:	
On the successful completion of the course, student will be able to:	
1	Understand the literary texts through listening and reading	K1, K2
2	Enhance the language skills of the students.	K3
3	Develop the verbal ability & reasoning or influence of language.	K3
4	Analyse the texts and appreciate literature with literary competence.	K4
5	To assess the view of the authors.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit:1	**POETRY**	**15 hours**
1. The Bird Scantury – SarojiniNaidu 2. Meeting at Night – RobertBrowning 3. A Different History – SujathaBhatt		

Unit:2	**PROSE**	**15 Hours**
1. Fusion Music – RaviShankar 2. The Sea – RobertLynd 3. Unity of Minds – A.P.J.AbdulKalam		

Unit:3	**SHORT STORIES**	**15 Hours**

1. He Boy who broke the Bank – RuskinBond
2. The Blue Bouquet – OctavioPaz
3. Happy Prince – OscarWilde

Unit:4	WORLD RENOWNED SPEECHES	15hours

1. Noble Prize Acceptance Speech – ToniMorrison

2. Chicago Address – SwamiVivekanandha

Unit:5	GRAMMAR AND COMPOSITION	13 hours

1. Clauses – Conditional, Relative, Restrictive,Non-Restrictive
2. Notice
3. Agenda
4. Minutes
5. Expansion ofIdeas
6. PrecisWriting

Unit:6	CONTEMPORARY ISSUES	2 hours

	Total Lecture hours	75hours

Text Book(s)

1	DRIZZLE- Cambridge University Press

Reference Books

1	High school English Grammar and composition by WREN & MARTIN

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://learnenglish.britishcouncil.org/skills
2	https://www.fluentu.com/blog/english/easy-english-lessons/

Course Designed By:

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

PROGRAMME OUTCOME (PEO):

PO1	To increase the interest towards Mother tongue
PO2	Knowledge of glossaries will increase.
PO3	Malayalam language expression will rise.
PO4	Learners will enrich their Malayalam Literature
PO5	The desire to read literature, such as the essay on a poem, develops.
PO6	Knowledge such as reading, understanding and critique of literature will improve
PO7	The knowledge of expressing one's opinion in Malayalam will improve.
PO8	Communication knowledge will increase.
PO9	Develop a skill in translation.
PO10	They will learn more about our Indian Culture and the values of Human being.

PROGRAM SPECIFIC OUTCOME (PSO):

PSO1	Develop an interest in the appreciation of literature.
PSO2	Discuss and respond to content of a reading passage.
PSO3	Learning the literacy knowledge of Malayalam specially reading and writing.
PSO4	Learning the literary knowledge specially reading and understanding of Malayalam short Stories
PSO5	Learning the history of Malayalam literature
PSO6	The ability to translate from English to Malayalam will be improved.
PSO7	Develop a skill in handle literature

BHARATHIAR UNIVERSITY : COIMBATORE – 641 046
Part I – Malayalam Language
For Under-graduate Degree Programme
(For the students admitted during 2025-2026 onwards)

Course code	MAL1	PART I MALAYALAM PAPER I	L	T	P	C
			3	-	-	3
Pre-requisite			Syllabus Version			2025-26

COURSE OBJECTIVE:

- Improves grammatical knowledge
- Will continue to read and learn about articles and think about them
- It is possible to read and understand short stories and understand the thoughts and life of the people of this state
- Translation knowledge and the ability to read and analyze a message are also available
- Translation knowledge and the ability to read and analyze a message are also

S.No	COURSE OUTCOME	
CO1	Understand the text styles and grammatical elements	K1
CO2	Discuss the content of a reading passage	K1
CO3	Develop an interest in the appreciation of short stories	K2
CO4	Comprehend the grammatical structures and sentence making	K3
CO5	Understand the language and developing English to Malayalam translation skill	K4

	PART I MALAYALAM PAPER I	
Unit No.		HOURS
I	Novel -Njanabharam - E. Santhoshkumar	18
II	Novel - -Njanabharam - E. Santhoshkumar	18
III	Short Story - Ente Priyapetta Kadhakal –Sara Joseph	14
IV	Short Story - Ente Priyapetta Kadhakal – Sara Joseph	12
V	Composition & Translation (English to Malayalam)	10
	TOTAL	72

Teaching methods:

Lecturing, Assignment, Group Discussion, Quiz, Group Activity. PowerPoint Projection through LCD

Text Books:
   Novel -Njanabharam - E. Santhoshkumar
     (Mathrubhumi Books, Kochi, , Kerala)
     ShortStory-Ente Priyappeta Kadhakal -Sara Joseph
     (D.C.Books,Kottayam, Kerala)
     Expansion of ideas, General Eassay and Translation. (A Simple passage)

Reference Books:

1.Malayala Novel SahithyaCharitram-K.M.Tharakan (N.B.S.Kottayam)
2.Cherukatha Innale Innu-M.Achuyuthan (D.C Books, Kottayam)
3.Sahithya Charitram Prasthanangalilude- Dr.K.M George,
   (D.C.Books Kottayam)
4. Malayala Sahithyavimarsam- Sukumar Azheekode (D.C.books)

Mapping with Programme Outcomes

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

COURSE PREPARED	Letha.K Assistant Professor lethasngc83@gmail.com

SECOND SEMESTER – MALAYALAM - PAPER II

Course code	MAL2	PART I MALAYALAM PAPER II	L	T	P	C
			3	-	-	3
Pre-requisite			Syllabus Version			2025-26

COURSE OBJECTIVE:

To understand the genre of travel writing and its ability to convey cultural and experiential narrative.

Analyze the descriptive techniques used to portray places and experiences.

To study autobiographical writing and its reflection of an individual's life and experiences..

Discuss the inspirational aspects of the autobiography and their relevance to personal growth.

To encourage Translating skills

S.No	COURSE OUTCOME	
CO1	Develop the ability to critique and appreciate travel literature, focusing on descriptive language and personal reflections.	K1
CO2	Analyze the narrative style and travel writing techniques employed by the author.	K1
CO3	Encourage self-reflection and the ability to relate personal experiences with broader social and cultural issues.	K2
CO4	Explore the personal history and anecdotes shared by the author.	K3
CO5	Understand the life experiences and personal journey of the author.	K4

Unit No.	PART I – MALAYALAM II	Hours
I	Travelogue - Pravasiyude kurippukal - Babu Bharadwaj	18
II	Travelogue - Pravasiyude kurippukal - Babu Bharadwaj	18
III	Autobiography- Chirikku pinnil - Innocent	14
IV	Autobiography- Chirikku pinnil - Innocent	12
V	Translation (English to Malayalam)	10
	TOTAL	**72**

Teaching methods:

Lecturing**,** Assignment, Group Discussion, Quiz, Group Activity. PowerPoint Projection through LCD

Text Books:

Pravasiyude kurippukal - Babu Bharadwaj –-Mathrubhumi Books, Kochi, Kerala

Chirikku pinnil - Innocent -Mathrubhumi Books, Kochi, Kerala

Reference Books:

Athmakathasahithyam Malayalathil-Dr.Vijayalam Jayakumar (N.B.S.Kottayam)
Malayala Novel SahithyaCharitram-K.M.Tharakan (N.B.S.Kottayam)
SahithyaCharitramPrasthanangalilude- Dr.K.M
George,   (D.C.Books Kottayam)
MalayalaSahithyavimarsam-Sukumar Azheekode (D.C.books)

Mapping with Programme Outcomes

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

COURSE PREPARED	Letha.K Assistant Professor lethasngc83@gmail.com

THIRD SEMESTER - MALAYALAM - PAPER III

Course code	MAL3	PART I - MALAYALAM-PAPER III	L	T	P	C
			3	-	-	3
Pre-requisite			Syllabus Version			2025-26

COURSE OBJECTIVE:
May have knowledge of the contents of primitive poetry
Learn about contemporary poetry and its techniques.
Interest in reading poetry and the ability to express social thoughts will improve
This will help you to understand the basics of Malayalam Poetry and to understand Malayalam literature properly
It will provide knowledge of the elements of poetry.

S.No	COURSE OUTCOME	
CO1	Get a basic knowledge of the history of Malayalam literature.	K1
CO2	Enhances the art and taste of Malayalam literary works	K1
CO3	Literary genres can be learned	K2
CO4	Create more to read and enjoy Malayalam poetry	K3
CO5	Get the basic Knowledge of poetry techniques	K4

Unit No	PART I – MALAYALAM III	Hours
I	Poetry – Sishyanum makanum - Vallaththol Narayana Menon	18
II	Poetry – Sishyanum makanum - Vallaththol Narayana Menon	18
III	Poetry - Rafeeque Ahammed (Selected poetries – Thoramazha,Madhuranarangakal,Athrayum,Umma,Pakaram)	10
IV	Poetry-RafeequeAhammed(Selectedpoetries-Ammathottil,Vidhyalayam, Thottakutty,Sivakami,Ithanu prarthana)	12
V	Poetry – Aayisha – Vayalar Ramavarma	14
	TOTAL	72

Teaching methods:
Lecturing**,** Assignment, Group Discussion, Quiz, Group Activity. PowerPoint
Projection through LCD

TextBooks:

1. Sishyanum makanum - Vallaththol Narayana Menon,Poorna Publishers.
2. - Rafeeque Ahammed – Selected poetries ,Mathrubhumi Books, Kozhikkode
3. Aayisha – Vayalar Ramavarma - Kerala Book Store Publishers.

Reference Books:

1.Kavitha SahithyaCharitram-Dr.M.Leelavathi (Kerala SahithyaAcademy,Trichur)
2.Kavitha Dwani-Dr.M.Leelavathi (D.C.Books, Kottayam)
3.Aadhunika SahithyacharithramPrasthanangalilude-Dr.K.M.George (D.C.Books, Kottayam)
4.Padya SahithyaCharithram – T.M.Chummar (Kerala SahithyaAcademy,Trichur)

COURSE PREPARED	Letha.K Assistant Professor lethasngc83@gmail.com

FOURTH SEMESTER-MALAYALAM –PAPER-IV

Course code	MAL4	PART I MALAYALAM PAPER IV	L	T	P	C
			3	-	-	3
Pre-requisite			Syllabus Version			2025-26

COURSE OBJECTIVE:
Knowledge of contemporary drama contents of Malayalam literature Learn Screen play and its techniques. The ability to read drama and express criticism about it and the ability to express social thoughts will improve There will also be litigation messages in Malayalam and news on speech techniques Able to write articles on their own and improve their creative skills.

S.No	COURSE OUTCOME	
CO1	Get a basic knowledge of drama	K1
CO2	Can read and critique Screenplay	K1
CO3	Create interest in art literature courses	K2
CO4	The hope of writing a Drama or a Screenplay.	K3
CO5	The idea of creating new works and critique knowledge will improve	K4

Unit No.	PART I – MALAYALAM IV	Hours
I	Screen Play - Bharatham - A.K.Lohithadas	18
II	Screenplay - Bharatham - A.K.Lohithadas	18
III	Drama – Kanchana Seetha -C.N.Sreekantan Nair	10
IV	Drama - Kanchana Seetha -C.N.Sreekantan Nair	12
V	Drama - Kanchana Seetha -C.N.Sreekantan Nair	14
	TOTAL	72

Teaching methods:

Lecturing**,** Assignment, Group Discussion, Quiz, Group Activity. PowerPoint Projection through LCD

Text *Books:*
1.Bharatham - A.K.Lohithadas-Mathrubhumi Books, Kochi, Kerala
2. Kanchanaseetha -C.N.Sreekantan Nair, D.C.Books, Kottayam

Reference Books:
1.MalayalaNatakaSahithyaCharithram. G Sankara Pillai (Kerala SahithyaAkademi, Trissur) 2.Malayala NatakaSahithyaCharithram, Vayala Vasudevan Pillai (Kerala Sahithya AcademyThrissur).
3.Natakam- OruPatanam (C.J. SmarakaPrasanga Samithi, Koothattukulam) 4.Natakaroopacharcha, Kattumadam Narayanan (NBS, Kottayam)
5.Chalachithra Sameeksha–Vijayakrishanan.
6.Cinemayude Paadangal- VisakalanavumVeekshanavum – Jose-K.Manual.

Mapping with Programme Outcomes

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

COURSE PREPARED	**Letha.K Assistant Professor** **lethasngc83@gmail.com**

First Semester– Paper I

Course: French I Course

Code: Credits: 4

Hours: 72

Course Objectives:

- Understand and use familiar everyday expressions and basic phrases aimed at the satisfaction of concrete needs.
- Recognize key aspects of Francophone cultures such as greetings, etiquette, daily life, and basic geography of French-speaking countries.
- Write short, simple texts such as postcards, emails, or short descriptions about themselves and their immediate environment.
- Construct simple sentences using correct word order and basic vocabulary.
- Develop sensitivity to cross-cultural differences in communication and social practices.
- Read and understand short, simple texts such as personal messages, advertisements, menus, and schedules.

Course Outcomes:

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

S.No	CourseOutcome	BloomsLevel
CO1	improve all the four French language skills (speaking, listening, reading, and writing) (Effective communicators)	K1
CO2	comprehend French and other Francophone nations' cultures and civilizations.	K2
CO3	comprehend the fundamentals of language structure, vocabulary, grammar, and phonetics (language skill).	K3
CO4	The French DELF-A1 Certification is appreciated.	K4

Part1-French I	
Unit No.	**Topics**
1	BIENVENUE (pg 10-17)
	Grammaire: pg(122-124)
2	CONTACTS(pg 18-28)
	Grammaire: pg(125-128)
3	COMMUNICATION pg(29-33)
	Grammaire: pg(129-130)
4	QU'EST-CE QU'IL FONT pg(34-44)
	Grammaire: pg(131-136)
5	COMMUNICATION pg(45-49)
	Grammaire: pg(137-139)
Semester I Portions from Textbook « Nouvelle Génération A1» : UNITÉ 1, UNITÉ 2(Pg 10-49) Cahier d'exercices (Pg122-139)	

S.No	Authors	Title	Publishers	Year & Edition
1	Luca Giachino, Carla Baracco, Romain Chrétien(DELF)	Nouvelle Génération A1	Didier FLE	2022 1 Ed.

Book Available at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

S.No	Authors	Title	Publishers	Year & Edition
1.	Nathalie Hirschsprung, Tony Tricot	COSMOPOLITE	Hachette	2017 1 Ed.

S.No	Related Online Contents
1	FUN MOOC Online course VIVRE EN France A1 Cours de français Alliance de français de Paris SWAYAM ONLINE COURSE BFLI -001- PARLER DE SOI/ BFLI-002 : FRENCH Échanger / Interactions (French) BY DR. DEEPANWITA SRIVATSAVA, IGNOU

Second Semester–Paper II

Course: French II

Course Code: Credits: 4

Hours: 72

Course Objectives:

- Understand and use familiar everyday expressions and basic phrases aimed at the satisfaction of concrete needs.
- Recognize key aspects of Francophone cultures such as greetings, etiquette, daily life, and basic geography of French-speaking countries.
- Write short, simple texts such as postcards, emails, or short descriptions about themselves and their immediate environment.
- Construct simple sentences using correct word order and basic vocabulary.
- Develop sensitivity to cross-cultural differences in communication and social practices.
- Read and understand short, simple texts such as personal messages, advertisements, menus, and schedules.

Course Outcomes:

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

S.No	Course Outcome	Knowledge Level
CO1	improve all the four French language skills (speaking, listening, reading, and writing) (Effective communicators)	K1
CO2	comprehend French and other Francophone nations' cultures and civilizations.	K2
CO3	comprehend the fundamentals of language structure, vocabulary, grammar, and phonetics (language skill).	K3
CO4	The French DELF-A1 Certification is appreciated.	K4

Part I-French II	
Unit No.	**Topics**
1	PORTRAITS(pg 50-60)
	Grammaire: pg(140-144)
2	COMMUNICATION(pg 61-65)
	Grammaire: pg(145-146)
3	TEMPS LIBRE(pg 66-68)
	Grammaire: pg(147)
4	MOTS ET EXPRESSIONS((pg 69-76)
	Grammaire: pg(148-151)
5	COMMUNICATION(pg 77-81)
	Grammaire: pg(152-155)
Semester II Portions from Textbook « Nouvelle Génération A1» : UNITÉ 3, UNITÉ 4(Pg 50-81) Cahier d'exercices (Pg140-155)	

S.No	Authors	Title	Publishers	Year & Edition
1	Luca Giachino, Carla Baracco, Romain Chrétien(DELF)	Nouvelle Génération A1	Didier FLE	2022 1 Ed.

Book Available at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

Books for Reference

S.No	Authors	Title	Publishers	Year & Edition
1.	Nathalie Hirschsprung, Tony Tricot	COSMOPOLITE	Hachette	2017 1 Ed.

Related Online Contents (MOOC, SWAYAM, NPTEL, Websites etc.,)

S.No	Related Online Contents
1	FUN MOOC Online course VIVRE EN France A1 Cours de français Alliance de français de Paris SWAYAM ONLINE COURSE BFLI -001- PARLER DE SOI/ BFLI-002 : FRENCH Échanger / Interactions (French) BY DR. DEEPANWITA SRIVATSAVA, IGNOU

Third Semester–Paper III

Course: French III

Course Code:

Credits: 4

Hours: 72

Course Objectives:

- Understand and use familiar everyday expressions and basic phrases aimed at the satisfaction of concrete needs.
- Recognize key aspects of Francophone cultures such as greetings, etiquette, daily life, and basic geography of French-speaking countries.
- Write short, simple texts such as postcards, emails, or short descriptions about themselves and their immediate environment.
- Construct simple sentences using correct word order and basic vocabulary.
- Develop sensitivity to cross-cultural differences in communication and social practices.
- Read and understand short, simple texts such as personal messages, advertisements, menus, and schedules.

Course Outcomes:

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

S.No	Course Outcome	Knowledge Level
CO1	improve all the four French language skills (speaking, listening, reading, and writing) (Effective communicators)	K1
CO2	comprehend French and other Francophone nations' cultures and civilizations.	K2
CO3	comprehend the fundamentals of language structure, vocabulary, grammar, and phonetics (language skill).	K3
CO4	The French DELF-A1 Certification is appreciated.	K4

Part I-French III	
Unit No.	**Topics**
1	VENDRE ET ACHETER(pg 82-92) Grammaire: pg(156-160)
2	COMMUNICATION(pg 93-97) Grammaire: pg(161-162)
3	TOUT LE MONDE S'AMUSE(pg 98-100) Grammaire: pg(163)
4	MOTS ET EXPRESSIONS(pg 101-107) Grammaire: pg(164-167)
5	COMMUNICATION(pg 108-120) Grammaire: pg(168-171)
Semester III Portions from Textbook « Nouvelle Génération A1» : UNITÉ 5, UNITÉ 6(Pg 82-120) Cahier d'exercices (Pg156-171)	

S.No	Authors	Title	Publishers	Year & Edition
1	Luca Giachino, Carla Baracco, Romain Chrétien(DELF)	Nouvelle Génération A1	Didier FLE	2022 1 Ed.

Book Available at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

Books for Reference

S.No	Authors	Title	Publishers	Year & Edition
1.	Nathalie Hirschsprung, Tony Tricot	COSMOPOLITE	Hachette	2017 1 Ed.

Related Online Contents (MOOC, SWAYAM, NPTEL, Websites etc.,)

S.No	Related Online Contents
1	FUN MOOC Online course VIVRE EN France A1 Cours de français Alliance de français de Paris SWAYAM ONLINE COURSE BFLI -001- PARLER DE SOI/ BFLI-002 : FRENCH Échanger / Interactions (French) BY DR. DEEPANWITA SRIVATSAVA, IGNOU

Course: French IV

Course Code:

 Credits: 4

Hours: 72

Course Objectives:

- Understand and use familiar everyday expressions and basic phrases aimed at the satisfaction of concrete needs.
- Introduce themselves and others, and ask and answer questions about personal details such as name, age, nationality, family, and daily routines.
- Recognize key aspects of Francophone cultures such as greetings, etiquette, daily life, and basic geography of French-speaking countries.
- Write short, simple texts such as postcards, emails, or short descriptions about themselves and their immediate environment.
- Construct simple sentences using correct word order and basic vocabulary.
- Develop sensitivity to cross-cultural differences in communication and social practices.
- Read and understand short, simple texts such as personal messages, advertisements, menus, and schedules.

Course Outcomes:

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

S.No	Course Outcome	Knowledge Level
CO1	improve all the four French language skills (speaking, listening, reading, and writing) (Effective communicators)	K1
CO2	comprehend French and other Francophone nations' cultures and civilizations.	K2
CO3	comprehend the fundamentals of language structure, vocabulary, grammar, and phonetics (language skill).	K3
CO4	The French DELF-A1 Certification is appreciated.	K4

Part I-French IV	
Unit No.	**Topics**
1	BIEN VENUE (pg 11-14) Grammaire: pg(121-122)
2	EN VILLE (pg 15-25) Grammaire: pg(123-127)
3	COMMUNICATION(pg 26-29) Grammaire: pg(128)
4	EN VOYAGE (pg 31-40) Grammaire: pg(129-133)
5	COMMUNICATION(pg 41-46) Grammaire: pg(134-137)
Semester IV Portions from Textbook « Nouvelle Génération A2» : UNITÉ 1, UNITÉ 2 (Pg 11- 46) Cahier d'exercices (Pg121-137)	

S.No	Authors	Title	Publishers	Year & Edition
1	Luca Giachino, Carla Baracco, Romain Chrétien(DELF)	Nouvelle Génération A2	Didier FLE	2022 1 Ed.

BookAvailable at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

Books for Reference

S.No	Authors	Title	Publishers	Year & Edition
1.	Nathalie Hirschsprung, Tony Tricot	COSMOPOLITE	Hachette	2017 1 Ed.

Related Online Contents (MOOC, SWAYAM, NPTEL, Websites etc.,)

S.No	Related Online Contents
1	FUN MOOC Online course VIVRE EN France A1 Cours de français Alliance de français de Paris SWAYAM ONLINE COURSE BFLI -001- PARLER DE SOI/ BFLI-002 : FRENCH Échanger / Interactions (French) BY DR. DEEPANWITA SRIVATSAVA, IGNOU

BHARATHIAR UNIVERSITY: COIMBATORE – 641 046
Part I – Hindi
For Under-graduate Degree Programme
(For the students admitted during 2025-2026 onwards)

Programme Educational Objectives (PEO)
Undergraduate Programme of Part I Hindi will be

PROGRAMME OUTCOME (PEO) :

- **PO1:** Basic knowledge of Hindi language will be improved.

- **PO2:** Knowledge of glossaries will increase.

- **PO3:** Hindi language expression will rise.

- **PO4:** Learners will enrich their grammar in Hindi.

- **PO5:** The desire to read literature, such as a story or a poem, develops.

- **PO6:** Knowledge such as reading, understanding and critique of literature will improve

- **PO7:** The knowledge of expressing one's opinion in Hindi will improve.

- **PO8:** Communication knowledge will increase.

- **PO9:** Develop a skill in translation.

- **PO10:** They will learn more about our Indian Culture and the values of Human being.

PROGRAM SPECIFIC OUTCOME (PSO):

PSO1: Develop an interest in the appreciation of literature.

PSO2: Discuss and respond to content of a reading passage.

PSO3: Learning the literary knowledge of Hindi specially reading and witing .

PSO4: Learning the literary knowledge specially reading and understanding of Hindi short Stories

PSO5:. Learning the history of Hindi literature.

PSO6: The ability to translate from Hindi to English and from English to Hindi will be improved.

PSO7:. Develop a skill in spoken Hindi.

Course code	HD1	PART I HINDI PAPER I	L	T	P	C
PART - I		PART I	3	-	-	3
Pre-requisite			Syllabus Version			2025-26

- **COURSE OBJECTIVE:**
- Improves grammatical knowledge
- Will continue to read and learn about articles and think about them
- It is possible to read and understand short stories and understand the thoughts and life of the people of this country
- Translation knowledge and the ability to read and analyze a message are also gained

Unit	PART I HINDI PAPER I	Hrs

I	**PROSE : BHARTHI GADYA SANGRAH**
	
	1.Sanskurthi hai kya? (Lalith nibandh)- Ramdhari singh Dinkar
	2. Voh cheeni Bhayi (Rekha chitra) – Mahadevi varma
	3. Badthe shor ka gahratha sankat (pradoshan)
	           - Rajendrakumr ray & Ravindra Varma
	4. Ghar Loutthe huye – (Athma katha) – Harivamshraai Bacchan
	5. Paramanu urja evam khadya padarth samrakshan (vaigyanik lek)-
	         Parmaanu urja vibhag (Bharth sarkar)
	6. Cinema (film) – Manmohan Chdda
		18

II	**NON DETAILED TEXT SHORT STORIES: AAT KAHANIYAN** 1. Vrath-bang – Jayashankar Prasad 2. Sath gathi - Premchand 3. parda - Yespal 4. Apna apna bhagya - Jaynendrakumar 5. Bhrammarakshas ka shishya - Mukthibhodh 6. Dana-bhusa - Markandeya	18
III	**GRAMMAR : SHABDHA VICHAR ONLY** (NOUN, PRONOUN, ADJECTIVE, VERB, TENSE, CASE ENDINGS) Theoretical & Applied.	14
IV	**TRANSLATION : English – Hindi only.** ANUVADH ABHYAS – III (1-15 lessons only)	12
V	**COMPREHENSION**: 1 Passage from ANUVADH ABHYAS–III (16-30)	10
	TOTAL	72

Teaching methods:

Lecturing**,**Assignment,GroupDiscussion,Quiz,GroupActivity.PowerPointProjection through LCD

Text Book:

Bharathi gadya sangrah, editor : Madhudhavan, publisher : Vani prakashan, 4697/5,Daryaganch, New Delhi – 110002.
Aatt Kahaniyan, Editor : Dr. H.R. Mihir, Publisher : Jaya bharthi prakashan, 267 B, Maya press Road, Allahabad–211 003

Reference Books:

NAVEENHINDIVyakaran, 2002,DakshinBharatHindiPracharSabha,Chennai–600017

Web Link:

https://hi.wikipedia.org/wiki/https://en.wikipedia.org/wiki/Premchandhttp://hindigrammar.in/

S.No	COURSE OUTCOME
CO1	Understand the text styles and grammatical elements
CO2	Discuss the content of a reading passage
CO3	Develop an interest in the appreciation of short stories
CO4	Comprehend the grammatical structures and sentence making
CO5	Understand the language and developing English to Hindi translation skill

Mapping with Programme Outcomes									
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	S	S	S	S	S
CO3	M	S	S	M	S	M	S	S	M	S
CO3	S	M	M	M	M	S	S	M	S	M
CO4	L	S	L	S	L	S	L	M	M	M
CO5	S	S	M	M	S	M	L	L	L	L

COURSE PREPARED	Dr.S.S.Resmi resmivijay6@gmail.com

SECOND SEMESTER – HINDI - PAPER II

Course code	HD2	HINDI PAPER II	L	T	P	C
PART - I		PART I	3	-	-	3
Pre-requisite			Syllabus Version		2025-26	

- **COURSE OBJECTIVE:**
  - A basic understanding of contemporary poetry can be gained and the nature of modern poetry can be realized.
  - Realizing the nature of drama and its nature and improving the knowledge of reading and understanding the nature of contemporary plays.
  - Understands the benefits of correspondence and can enhance the correspondence you need.
  - Translation is especially useful for translating from Hindi to English

Unit No	PART I - HINDI II	Hours
I	**MODERN POETRY : KAVYA PARASAR** 1. Niyam – Kedarnath Singh 2. Ladki aur andha aadhmi – Manglesh Dablar 3. Daily Passenger – Arun kamal 4. Thodi si jagah – Rajesh joshi 5. Haddy Khopdi Khatra nishan – Veeren Dangvala 6. Bejghah – Anaamika	18

II	**ONE ACT PLAY: SONE KI VARSHA**
	     1. Sitha – Dvijendarlal rai
	     2. Parivartan - Ke Aiyanaar
	     3. Apoorva Thyag - Balashaur reddy
	     4. Sone ki varsha - Dayavathi Bhardhvaj
	     5. Sachcha Insaf - Avadh Nandan
		18

III	**LETTER WRITING** (Leave Letter, Job Application, Ordering Books, Letter to Publisher, Personal Letter)	10
IV	**CONVERSATION**: (Doctor & Patient, Teacher & Student, Storekeeper & Buyer, Two Friends, Booking Clerk & Passenger at Railway Station, Auto rickshaw driver and Passenger)Ref : Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan Vani Prakashan, New Delhi.	12
V	**TRANSLATION: HINDI-ENGLISH ONLY** Lessons – 1-15 only ANUVADH ABYAS-III	14
	TOTAL	72

Teaching methods:

Lecturing**,**Assignment,GroupDiscussion,Quiz,GroupActivity.PowerPointProjection through LCD

Text Book:

Kavya Parasar, Dr.Bolanath**,** Jawahar Pusthakalay, Sadar Bazaar,Mathura-U.P.281001.
Sone ki Varsha- Dakshin Bharat Hindi Prachar Sabha, Chennai – 600 017

Reference Books:

BolchalKiHindiAurSanchar,2015,Dr.MadhuDhavanVaniPrakashan, NewDelhi.

Web Link:

https://hi.wikipedia.org/wiki/https://en.wikipedia.org/wiki/Premchan dhttp://hindigrammar.in/

S.No	PROGRAMME OUTCOME
CO1	Get a basic understanding of renewal poetry and the essence of the poem
CO2	It is possible to understand the genre of Drama
CO3	Translating skill improved specially from English to Hindi
CO4	Knowledge is gained by using phrases and idioms
CO5	Learners can express opinion in small sentences

Mapping with Programme Outcomes

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

COURSE PREPARED	Dr.S.S.Resmi resmivijay6@gmail.com

THIRD SEMESTER - HINDI - PAPER III

Course code	HD3	HINDI - PAPER III	L	T	P	C
PART - I		PART I	3	-	-	3
Pre-requisite			Syllabus Version		2025-26	

- ● **COURSE OBJECTIVE:**
- ● May have knowledge of the contents of primitive poetry
- ● Learn about contemporary poetry and its techniques.
- ● Interest in reading poetry and the ability to express social thoughts will improve
- ● This will help you to understand the basics of Hindi literature and to understand Hindi literature properly
- ● Knowledge of the elements of poetry and the knowledge of subtle translation will improve.

Unit No	PART I - HINDI III	Hours
I	POETRY:**KAVYA THARANG – by Dr. NIRANJAN** **PRACHEEN KAVITHA** 1. MAHATMA KABEER – Sakhi & Padh (2) 2. GOSWAMY TULSIDAS – Pad(4) 3. MAHATMA SOORDAS- Pad(3) 4. KAVIVAR RAHIM – DOHE(6)	18
II	**MODERN POETRY : KAVYA THARANG- by Dr. NIRANJAN** 1. Nirjar – Mythili sharan gupth 2. Parichay – Ramdhari singh Dinkar 3. Prethibimb – Sumithra nandan Panth 4. Kavi kaha ththa – Sooryakanth Tripati Nirala 5. Kah de mam Kya ab dekoon – Mahadevi varma 6. Kanu ke prathi – Darmveer Bharathi 7. Loha ka swad – Dhumil 8. Bhanth Kidikkiyon ki Takrahat – Gorakh pande	18
III	**HISTORY OF HINDI LITERATURE** :(TIPPANIYAN) 1.Bhakthi kal ka samanya parichaya (Kabeer, Jaysi, Soor, Thulsi, Meera, Raskhan, Rahim)	10

IV	**Ras Chad & ALANKAR:**
	    1.Srungar & veer Ras
	    2. ANUPRAS & Upama
	    3. Dhoha & Rola
		12

V	**TRANSLATION** : **ENGLISH-HINDI only**
	                 ANUVADH ABHYAS – III
	                 (16-30 Lessons only)
		14

	TOTAL	**72**

Teaching methods:

Lecturing**,**Assignment,GroupDiscussion,Quiz,GroupActivity.PowerPointProjection through LCD

Text Book:

Kavya Tharang – by Dr. NIRANJAN**,** Jawahar Pusthakalay, Sadar Bazaar,Mathura-U.P.281001.
Anuvadh abyas-III,Dakshin Bharath Hindi Prachar Sabha Chennai – 17.

Reference Books:

Hindi sahithya ka saral ithihaas,by Rajnath sharma, vinod pustak mandir, agra-282
Kavya Pradeep Rambadri Shukla, Hindi Bhavan, 36, Tagore Town, Allahabad – 211 002.

Web Link:

https://hi.wikipedia.org/wiki/https://en.wikipedia.org/wiki/Premchand

S.No	COURSE OUTCOME
CO1	Get a basic knowledge of the history of Hindi literature.
CO2	Enhances the art and taste of Hindi literary works
CO3	Literary genres can be learned
CO4	Create an interest to read and enjoy Hindi poetry
CO5	Get the basic Knowledge of poetry techniques like Anlankar.

Mapping with Programme Outcomes

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

COURSE PREPARED	Dr.S.S.Resmi resmivijay6@gmail.com

FOURTH SEMESTER-HINDI –PAPER-IV

Course code	HD4	HINDI PAPER IV	L	T	P	C
PART - I		PART I	3	-	-	3
Pre-requisite			Syllabus Version		2025-26	

- ● **COURSE OBJECTIVE:**
- ● Knowledge of contemporary drama contents of Hindi literature
- ● Learn novels and its techniques. The ability to read novels and express criticism about it and the ability to express social thoughts will improve
- ● There will also be litigation messages in Hindi and news on speech techniques
- ● Able to write articles on their own and improve their translation skills.

Unit No.	PART I - HINDI IV	Hours
I	**DRAMA: Aashad ka ek din By Mohan Rakesh**	18
II	**NOVEL : GABAN – Premchand**	18
III	**LOKKOTHI & MUHAVARE -** NAVEEN HINDI VYAKARAN (Selected Lokkokthi -10 & Muhavare-10)	10
IV	**GENERAL ESSAY : AADARSH NIBANDH**	12
V	**TRANSLATION : HINDI-ENGLISH only ANUVADH ABHYAS – III (16-30 Lessons only)**	14
	TOTAL	72

Teaching methods:

Lecturing**,**Assignment,GroupDiscussion,Quiz,GroupActivity.PowerPointProjection through LCD

Text Book:

Aashad ka ek din –Drama- Mohan Rakesh, Publisher : Rajpal & sons Kashmeeri gate Delhi– 110006.
Gaban –Novel- Premchand,2015, Rajkamal Prakashan,1B Nethaji Subash Marg,New Delhi.

Reference Books:

Hindi sahithya ka saral ithihaas,by rajnath sharma, vinod pustak mandir,Agra-282
Kavya Pradeep Rambadri Shukla, Hindi Bhavan, 36, Tagore Town, Allahabad – 211 002.

Web Link:

https://hi.wikipedia.org/wiki/https://en.wikipedia.org/wiki/Premchandhttp://www.hindisamay.com/content/259/https://www.hindisamay.com/content/1050/2

S.No	COURSE OUTCOME
CO1	Get a basic knowledge of drama
CO2	Can read and critique novels
CO3	Creat the interested in art literature courses
CO4	The hope of writing an essay in genaral topic
CO5	The idea of creating new works and critique knoledge will improve

Mapping with Programme Outcomes

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

COURSE PREPARED	Dr.S.S.RESMI resmivijay6@gmail.com

BHARATHIAR UNIVERSITY : COIMBATORE – 641 046
(For the students admitted during 2020-2021 onwards)
QUESTION PAPER PATTERN
FIRST SEMESTER HINDI -PAPER-I
(Maximum Marks 75)

SECTION – A (10 x 1 = 10)
Multiple Choice Questions

Multiple Choice Questions :

5 Questions from Prose Text

5 Questions from non-detailed text (Multiple Choice Questions)

SECTION – B (5 x 5 = 25)
(either / or pattern)
Two annotations from Prose text only. (Either / or Pattern)
Two Short note from non-detailed (Either / or Pattern)
Applied Grammar – 5 Questions (Sentences)
(Gender, Number, Tense, Verb, Error Corrections)

SECTION – C (5 x 8 = 40)
(Either or pattern)

1. One Essay from Prose
2. One Essay from non-detailed text.
3. One Essay from Grammar (Theoretical)
4. Comprehension passage with 4 Questions
5. One passage – English to Hindi Translation

- -

SECOND SEMESTER - HINDI-PAPER-II
(Maximum Marks 75)

- -

SECTION – A (10 x 1 = 10)
Multiple Choice Questions

5 Questions from Modern Poetry
5 Questions from One Act Play

SECTION – B
(5 x 5 = 25)
Two annotations from Poetry   **(either / or**
       pattern)
Three Short answers from One Act Play
SECTION – C (5 x 8 = 40)
(Either or pattern)
One Essay from Poetry
One Essay from One Act Play
One Letter writing
One Conversation
One passage – Hindi to English Translation

QUESTION PAPER PATTERN
THIRD SEMESTER - HINDI-PAPER-III
(Maximum Marks 75)

SECTION – A (10 x 1 = 10)
Multiple Choice Questions

5 Questions from Old Poetry
5 Questions from History of Hindi Literature

SECTION – B (5 x 5 = 25)
(either / or pattern)

1 Annotation from Ancient Poetry.
1 Annotation from Modern & Contemporary Poetry
1 Short note from Ras
1 Short note from Chand
1 Short note from
Alankar

SECTION – C (5 x 8 = 40)
(Either or pattern)

One essay from Ancient Poetry
One Essay from Modern Poetry
One Essay from History of Hindi Literature
One short note (poet and literature)
One passage – English to Hindi Translation

FORTH SEMESTER PAPER-IV
(Maximum Marks 75)

SECTION – A (10 x 1 = 10)
Multiple Choice Questions

5 Questions from Drama
5 Questions from Novel

SECTION – B (5 x 5 = 25)
(either / or pattern)

TWO Short Notes from Drama.
ONE short notes from Novel.
ONE short notes Lokokthi
ONE short notes Muhavre

SECTION – C (5 x 8 = 40)
(Either or pattern)

One essay from drama.
Two essays from novel
One General essay.
One passage – Hindi to English Translation

Programme:	B.A./B.Sc./B.COMM/BBA, Degree Courses
Duration:	Only in Four Semesters
Programme Outcomes:	1. To produce competent students, academicians, and writers in the field of Kannada Language and Literature. 2. To provide the brief vision of the historical development and the evolution of the sensibility in Kannada 3. To understand the compositional analysis in Kannada writings. 4. To attract more students in Kannada Literature study.

5. To enable them to write for media

PSO 1 (PSE =PROGRAMME SPECIFIC OUTCOMES)
The students are to ensure the up-to-date level of understanding the concepts of basics in Kannada Language and Literature.

PSO 2
The Students are to ensure the competence and performance in Kannada Language.

PSO 3

The Students are to ensure the style variations and new trends in Kannada Literature.

PSO 4

An overview of world Literature from the perceptive of Kannada Literature.

PSO 5

To generalize social mobility in terms of literary sensibility.

KANNADA – UG - Syllabus

Programme Specific Outcomes:	After the successful completion of the course the students are expected to do the following: ● To implement the grammatical and linguistic competence in accordance with the context and text. ● To be more curious about study the further development in Kannada Language and Literature. ● To do higher studies in Kannada Language and Literature. ● To enrich the students in the various field of the literary as well as the linguistic level in Kannada. ● To bring out reference books and other materials for future generation.

Semester	Course Code	Title of the Course	Core/ Elective/ Soft Skill	Credits
I	KAN	Paper-I, Ancient and Medieval Poetry		3
II	KAN	Paper-II, Modern poetry and General Essay		3
III	KAN	Paper-III, Modern Kannada Prose		3
IV	KAN	Paper-IV, Kannada Drama and Translation		3

Course Objectives	
Recall (K1) - List, Identify, Enumerate, Define	1. Students are capable of evaluating different literary sensibilities.
	2. Enable them to understand the history of Literature in Kannada
Understand/Comprehend (K2) - Describe, Explain, Outline, Briefly Summarise	3. Enable them to differentiate new trends in literary genres.
	4. Enable them to identify the nature of development of Kannada Literature.
Apply Knowledge (K3) - Interpret, Calculate, Select, Employ, Generalise	5. Enable them to translate Kannada Literature into another Language.
Analyze and Evaluate (K4 and K5) - Compare and Contrast, Differentiate, Evaluate, Critically Assess, Review an Idea	
Create(K6) - Conceive, Theorise, Conceptualiseetc	

Semester - I

Course I	Core/Elective/Soft Skill
Title of the Course:	**Paper-I, Ancient and Medieval Poetry**
Credits:	3
Pre-requisites, if any:	To expose students to the Ancient and Medieval Kannada Literature. They learn about the Literary Heritage, Culture, Religic developments etc. Also to make them to understand and appreciate Old Literature a representative collection of Ancient and Medieval poetry of about 100 pages is prescribed. General understanding, appreciation of poetry, poetical beauty, the language of the poetry etc., are to be taught.
Course Outcomes (Use verbs like interpret, calculate,employ,generalise, evaluate, differentiate, critically assess, review, enumerate, identify, state, describe, explain, outline, select, recall, understand, compare and contrast, evaluate, critique, revise, summarise, demonstrate, draft, report, explain, obtain, recognise, respond, display)	1. To understand ancient literary text & Medieval Poetry in Kannada 2. To describe text and context of ancient literature and Medieval Texts in Kannada 3. To evaluate the difference between the ancient style of writing. 4. To describe about the style of the authors. 5. To narrate the poetry and improve in understanding the poetry
UNITS	
I	Introduction to Ancient Kannada Literature
II	Prescribed text Lessons 1,2,3,4
III	Prescribed text Lessons 5,6,7,8
IV	Prescribed text Lessons 9,10,11 and 12
V	Critical appreciation of Ancient and Medieval Poetry-their contents and expression
Reading List (Print and Online)	1. Parakrama dhavalana Parakramam –Pampa 2. Bheema Dhuryodhaniyam-Ranna 3. Vachanagalu 4. Bedara Kannappana ragale-Harihara 5. Sudugadu Hageyayte-Raghavankha 6. Haydudu tale nabha stalake-Kumaravyasa 7. Maaniniyariche-Kumaravyasa 8. Maye meredalu baala leeleyali-Chamarasa. 9. Ragi vreehi samvada-Kanakadaasa 10.Karubariddoorinde kaadollithu-Lakshmisha 11.Garathiya Haadugalu-Jaanapad geethegalu 12. Govina haadu

Recommended Texts	**Pracheena Kavya Marga-3**, H. Nagarajaih & Others (Ed), 1995, Prasaranga, Bangalore University, Bangalore-56

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	3	2	3	1	2
CO 2	3	3	1	3	3	2	3	2
CO 3	3	2	3	3	3	2	1	3
CO 4	3	3	3	3	3	3	2	3
CO 5	3	3	3	2	2	1	3	1

Level of Correlation between PSO's and CLO's

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	3	3	3	3	2
CLO 2	3	3	3	3	2
CLO 3	3	2	3	2	3
CLO 4	3	3	3	2	3
CLO 5	2	2	2	3	3
Weightage	14	13	14	13	13
Weighted percentage of Course Contribution to PSOs	2.8	2.6	2.8	2.6	2.6

Strong- 3   Medium – 2   Low - 1

Semester – II

Course - 2	Core/Elective/Soft Skill
Title of the Course :	**Paper-II, Modern poetry and General Essay**
Credits :	03
Pre- requisites, if any:	To expose the students to the Modern Kannada poetry and train them to write essays. For this an anthology of about 100 pages of Modern Poems covering different general trends, forms and contents is prescribed. Essay on given topics relating to Literature, Culture, Art, Education, Communication, Sports, Environment, Current Affairs etc., are to be given.
Course Outcomes	1. To understand the Contemporary literary text in Kannada 2. To Explain the Contemporary author style of writings 3. To evaluate the difference between the ancient and Contemporary Literature. 4. To brief the content of the techniques of General Essay Writing 5. To use grammatical styles in writing.
Units	
I	Beginning of modern Kannada Poetry-trends-themes-contents-Poetry-in a birds eye view
II	Text Poems from Part I -1,2,9, Part II - 2,4,6
III	Text Poems from Part III - 1,3, 14, 16
IV	Text Poems from Part IV - 6,8,11, Part V - 2,6,8
V	Poems reading-appreciation-general-acquaintance of the writers of the prescribed poems
Reading List (Print and Online)	Part -I :1. Belagu-Bendre 2. Devaru ruju maadidanu-Kuvempu 9. Sharade-G.S.Shivarudrappa Part-II :2.Mane tumbisuvudu-V.Seetaramaiah 4. Nalli taav nam malli-G.P.Rajaratnam 6.Tungabhadre - K.S.Narasimhaswamy Part-III :1.Kurudu kanchaana-Bendre 3. O! Nanna Janave!-GopalaKrishna adiga 14.Samadhaana-G.P.Rajarathnam 16.Amma Aachara Naanu-K.S.Nisar Ahmad. Part-IV :6.Mabbininda Mabbige-G.S.Shivarudrappa 8. Kaala Nilluvudilla-Channaveera Kanavi 11.Maneyinda manege- K.S.Narasimhaswamy Part-V :2.Vishva kutumbiya kashta-Pu.thi.na.

	6.Atithigalu- GopalaKrishna adiga 8.Angula Huluvina parakaaya pravesha-A.K.**Ramanujam**	
Recommended Texts	**Samakaaleena Kannada Kavithe-I,** Ed. G.S. Shivarudrappa, 2000, Prasaranga, Bangalore University, Bangalore-560 001	

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	3	2	3	1	2
CO 2	3	3	1	3	3	2	3	2
CO 3	3	2	3	3	3	2	1	3
CO 4	3	3	3	3	3	3	2	3
CO 5	3	3	3	2	2	1	3	1

Level of Correlation between PSO's and CLO's

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	3	3	3	3	2
CLO 2	3	3	3	3	2
CLO 3	3	2	3	2	3
CLO 4	3	3	3	2	3
CLO 5	2	2	2	3	3
Weightage	14	13	14	13	13
Weighted percentage of Course Contribution to PSOs	2.8	2.6	2.8	2.6	2.6

Strong- 3   Medium – 2   Low - 1

Semester - III

Course - 3	
Title of the Course	Paper-III, Modern Kannada Prose
Credits :	**03**
Pre- requisites, if any:	To expose the students for Modern Kannada Prosaic Literature and teach them to understand the literature and enjoy. A novel of about 200 pages are prescribed. The general appreciation and evaluation of the theme, development and the techniques of the prescribed text are to be learnt.
Course Outcomes	1. To understand the significance of the current phase of Prose 2. To Explain the nature of modern Novels in Kannada 3. To evaluate the culture of the society through Novels 4. Understand the Critical outlook of the Texts 5. To interpret the various styles of Novels.
Units	
I	Development of Modernism in Kannada Literature - the trends-Fiction prose writers-introduction about the author and texts.
II	The Novel - Alida mele (Novel Story and Theme)
III	The Novel-Alida mele (First half)
IV	The Novel- Alida mele (Second half)
V	The critical appreciation of the texts
Reading List (Print and Online)	L.S. Sheshagiri Rao, Hosagannada Sahitya charitre, Ankita Pustaka, No.53, Shamsingh Complex, Gandhi bazaar Road, Bagsavanagudi, Bangalore-560 004
Recommended Texts	**Dr. Shivarama Karanatha**, 1996, Alida Mele, SBS Publishers & Distributers, Bangalore-01

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	3	2	3	1	2
CO 2	3	3	1	3	3	2	3	2
CO 3	3	2	3	3	3	2	1	3
CO 4	3	3	3	3	3	3	2	3
CO 5	3	3	3	2	2	1	3	1

Level of Correlation between PSO's and CLO's

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	3	3	3	3	2
CLO 2	3	3	3	3	2
CLO 3	3	2	3	2	3
CLO 4	3	3	3	2	3
CLO 5	2	2	2	3	3
Weightage	14	13	14	13	13
Weighted percentage of Course Contribution to PSOs	2.8	2.6	2.8	2.6	2.6

Strong- 3   Medium – 2   Low - 1

Semester - IV

Course - 4	
Title of the Course :	**Paper-IV, Kannada Drama and Translation**
Credits :	**03**
Pre- requisites, if any:	Kannada Drama Literature is to be studied and enjoy. Learn to understand and appreciate the theme, characters, techniques and style of the Kannada Drama. A traditional or Modern drama either original or translation of about 100 pages to be learnt. A passage of about 100 words from English to be given for translation in to Kannada thus translation skill of the student also to be developed.
Course Outcomes	1. To understand the rich tradion of Kannada Drama 2. To Explain nature of Drama of Kannada 3. To describe the nature of understandings the Drama 4. To evaluate the culture of the society through Drama. 5. To know the techniques of the Translation in Kannada
Units	
I	Drama Literature in Kannada-Translation Dramas from Sanskrit and English-Development of Kannada Drama through many trends of 20thCentury. Elements of Drama-theme-characters-techniques and style etc., are to be described.
II	Prescribed Drama-Abhijnana Shakuntalam Act-1
III	Prescribed Drama-Abhijnana Shakuntalam Act-2
IV	Prescribed Drama-Abhijnana Shakuntalam Act-3
V	Techniques of Translation for Translation English to Kannada and Kannada to English.
Reading List (Print and Online)	**Avalokana**, Ed. Basavappa Sahstri virachita shakuntala naatakam, HM. Shankaranarayana Rao, Sharada mandir, Mysore.
Recommended Texts	**Karnataka Abhijnana shakuntala Natakam,** by Basavappa shastry, Sharada Mandira, 1973, Mysore-04.

Method of Evaluation:

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment:

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and cons

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

   **[Follow the same pattern for all Courses/Papers]- **Course means Paper Mapping with Programme Outcomes:

   Map **Course Outcomes (CO) for** each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1, 2, 3 (Strong, Medium and Low)**

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	3	2	3	1	2
CO 2	3	3	1	3	3	2	3	2
CO 3	3	2	3	3	3	2	1	3
CO 4	3	3	3	3	3	3	2	3
CO 5	3	3	3	2	2	1	3	1