
**ST. TERESA'S COLLEGE, ERNAKULAM
(AUTONOMOUS)**

Affiliated to Mahatma Gandhi University, Kottayam



**CURRICULUM FOR
BACHELOR'S PROGRAMME
IN BOTANY**

Under Choice Based Credit & Semester System
& Outcome Based Education

(2018 Admissions)

BBOT -BACHELOR'S PROGRAMME IN BOTANY
PROGRAMME SPECIFIC OUTCOMES

PSO1: Categorize the plant and animal kingdom from the Microbes to the most advanced life forms based on morphology, ecology and phylogeny.

PSO2: Recognize the concepts, processes and the applied aspects of chemistry and zoology.

PSO3: Evaluate the structural features and reproductive processes in plant groups and integrate the concepts and processes involved in the various cellular mechanisms.

PSO4: Explain environment consciousness, resource management, sustainable development and human rights.

PSO5: Illustrate expertise in the application of Botany for research and entrepreneurship and develop communicating skills to share the knowledge with the society effectively.

SEMESTER I

Course Code	Course Title	Credits	Course Type
EN1A01B18	Fine-tune Your English	4	Common Course I
EN1A02B18	Pearls from the Deep	3	
FR1A01B18	French Language and Communicative Skills-I	4	Common Course II
HN1A01B18	Kahaani Aur Upanyas		
MA1A01B18	Kathasahithyam		
CH1C01B18	Basic Theoretical and Analytical Chemistry	2	Complementary Course I
ZY1C01B18	Non Chordate Diversity	2	Complementary Course II
BO1B01B18	Methodology of Science and an Introduction to Botany	2	Core Course

SEMESTER I

COMMON COURSE I

EN1A01B18– FINE-TUNE YOUR ENGLISH

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1. Recognize the basics of English grammar.

CO2. Choose the appropriate word classes.

CO3. Identify common errors in the use of English language in various contexts.

CO4. Apply the rules of grammar to comprehend, speak, and write grammatically correct English.

CO5. Compose materials for business communication.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	2
CO2	1	1	1	1	3
CO3	1	1	1	1	2
CO4	1	1	1	1	3
CO5	1	1	1	1	2

Syllabus Content

Module 1

(18 Hours)

The Sentence and its Structure

How to Write Effective Sentences – Phrases:What are They? – The Noun Clauses – The Adverb Clause – “If All the Trees Were Bread and Cheese” – The Relative Clause – How Clauses are Conjoined

Module 2 (18 Hours)

Word-Classes and Related Topics

Understanding the Verb – Understanding Auxiliary Verbs – Understanding Adverbs – Understanding Pronouns – The Reflexive Pronoun – The Articles I – The Articles II – The Adjective – Phrasal Verbs – Mind your Prepositions

Module 3 (18 Hours)

To Err is Human

Concord – Errors – Common and Uncommon

Spelling and Pronunciation

Pronunciation: Some Tips – More Tips on Pronunciation – An awesome Mess? – Spelling Part II

Module 4 (18 Hours)

Tense and Related Topics

‘Presentness’ and Present Tenses – The ‘Presentness’ of a Past Action – Futurity in English – Passivisation

Interrogatives and Negatives

Negatives – How to Frame Questions – What’s What? – The Question Tag

Module 5 (18 Hours)

Conversational English

Some time expressions – Is John There Please?

Miscellaneous and General Topics

Reading

Letter Writing

In addition there will be an essay question on a general topic.

SEMESTER I

COMMON COURSE I

EN1A02B18– PEARLS FROM THE DEEP

Credits: 3

Total Lecture Hours: 72

Course Outcomes:

CO1: Name prominent literary figures and recognize various literary devices.

CO2: Analyze inherent themes and motives.

CO3: Identify the nuances of the age in which the literary work was written.

CO4: Examine the different aspects of theatre.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	2	2
CO2	1	1	1	1	1
CO3	1	1	1	3	1
CO4	1	1	1	2	3

Syllabus Content:

Module 1 (Fiction) (18hours)
Ernest Hemingway: The Old Man and the Sea

Module 2 (One Act Plays) (18hours)

Susan Glaspell: Trifles

Asif Currimbhoy: The Refugee

A.A Milne: The Boy Comes Home

Module 3 (Short Stories)

(18hours)

Guy De Maupassant: Two Friends

O. Henry: The Gift of Magi

K.A Abbas: Sparrows

Flora Annie Steel: Valiant Vicky, the Brave Weaver

Module 4 (Poems)

(18hours)

Rumi: The Chance of Humming

Walter Scott: Lochinvar

John Keats: La Belle Dame Sans Mercy

Robert Frost: After Apple Picking

Chinua Achebe: Refugee Mother and Child

Kamala Das: My Grandmother's House

Ted Hughes: Jaguar

Pablo Neruda: Tonight I can Write the Saddest Lines

P.P Ramachandran: How Simple It Is!

SEMESTER I

COMMON COURSE II

FR1A01B18 – FRENCH LANGUAGE AND COMMUNICATIVE SKILLS – I

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

CO1: Describe topics such as family, professions, time, place, likes and dislikes, daily life situations.

CO2: Develop language, vocabulary and grammar skills.

CO3: Articulate various speech sounds and their determined combinations.

CO4: Prepare conversations based on scenarios which helps while traveling.

CO5: Articulate the concepts to express one's opinion in a specific situation.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	3	2
CO2	1	1	1	1	3
CO3	1	1	1	1	2
CO4	1	1	1	1	3
CO5	1	1	1	2	3

Syllabus Content:

Module I

(25 hours)

La population L'alphabet – Les chiffres – Identité – Se présenter – Poser des questions – Les professions – Les nationalités

Module II

(23 hours)

La banlieue Demander une information, un prix – l'heure – la ville

Module III

(24 hours)

Quartier de Paris Décrire un lieu – Indiquer un prix, un itinéraire.

SEMESTER I

COMMON COURSE II

HN1A01B18– KAHAANI AUR UPANYAS

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

CO1: Discuss story content and structure in depth.

CO2: Analyze characterisation and comment on the development of the characters as the story/novel unfolds.

CO3: Analyze short stories and novels on the basis of literary elements like plot, theme, metaphor, and image.

CO4: Compare treatments of theme, character and subject matter of different short stories.

CO5: Illustrate greater reading fluency and improved vocabulary in Hindi.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	2	2
CO2	1	1	1	1	1
CO3	1	1	1	1	1
CO4	1	1	1	1	1
CO5	1	2	1	2	3

Syllabus Content:

MODULE- I (16 hrs)

Syllabus- Anthim Saakshya –Chandrakaanta Chapters 1 ,2

Eidgaah- Premchand

MODULE- II (20 hrs)

Syllabus-Anthim Saakshya –Chandrakaanta Chapters 3, 4, 5 Jangal Ka Daah- Swayam Prakash Chchutti
Ka Din- Usha Priyamvada

MODULE- III (20 hrs)

Syllabus- Anthim Saakshya –Chandrakaanta Chapters 6,7,8 Maa Rasoi Mei Rehti Hai – Kumar Ambuj
Kheer – Madhavi Kutty

MODULE- IV (16 hrs)

Syllabus- Anthim Saakshya –Chandrakaanta Chapters 9, 10 Heelibon Ki Baththakhe- Agyey

SEMESTER I

COMMON COURSE II

MA1A01B18- KATHASAHITHYAM

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

CO1: ചെറുകഥ, നോവൽ പഠനത്തിലൂടെ വായനാശേഷിയും ആസ്വാദനപ്രാപ്തിയും കൈവരിക്കൽ.

CO2: ചെറുകഥയുടെയും നോവലിന്റേയുംകാലാനുസൃതമായ ഭാവുകത്വപരിണാമം തിരിച്ചറിയൽ

CO3: നിലവിലുള്ളസാമൂഹ്യജീവിത യാഥാർഥ്യങ്ങളെ അഭിമുഖീകരിക്കാൻ പ്രാപ്തരാക്കൽ.

CO4: ആശയവിനിമയം, ഭാഷാവിഷ്കരണം എന്നീ ശേഷികൾ കൈവരിക്കുന്നു

CO5: കഥ,നോവൽ എന്നിവയുടെ വ്യതിരിക്ത സവിശേഷതകൾ തിരിച്ചറിയുന്നു.

CO6: പുതുകാലജീവിതാനുഭവങ്ങൾ വിലയിരുത്താൻ പര്യാപ്തരാകുന്നു

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	2
CO2	1	1	1	1	1
CO3	1	1	2	1	3
CO4	2	2	1	2	3
CO5	1	1	1	1	1
CO6	1	1	1	1	2

Syllabus Content:

ഖണ്ഡംഒന്ന് 10മണിക്കൂർ

1.പുവമ്പഴം -കാരുർ

2.ഭൂമിയുടെഅവകാശികൾ - വൈക്കംമുഹമ്മദ്ഖണ്ഡീർ

ഖണ്ഡം രണ്ട് - 15 മണിക്കൂർ

1. കടൽ - ടി . പദ്മനാഭൻ
2. പെരുമഴയുടെ പിറേന്ന് - എം. ടി. വാസുദേവൻ നായർ
3. മാനാഞ്ചിറ ട്രൈസ്റ്റ് - വി . കെ. എൻ
4. തരിശുനിലം - മാധവിക്കുട്ടി

ഖണ്ഡം മൂന്ന് - 15 മണിക്കൂർ

1. ആർക്കറിയാം - സക്കറിയ
2. ഓരോ എഴുത്തുകാരിയുടെ ഉള്ളിലും - സാനാജോസഫ്
3. തിരുത്ത് - എൻ . എസ് . മാധവൻ
4. മോഹമത്തെ - കെ . ആർ . മീര

ഖണ്ഡം നാല് - 10 മണിക്കൂർ

1. അഗ്നി - സിതാര . എസ്
2. ബിരിയാണി - സന്തോഷ് എച്ചിക്കാനം
3. മോദസ്ഥിരനായി അങ്ങ് വസിപ്പു മലപോലെ - എസ്. ഹരീഷ്
4. സ്നേഹബഹുമാനപ്പെട്ട അന്നമ്മയ്ക്ക് ഗീതാലക്ഷ്മി എഴുതുന്ന കത്ത് - പ്രിയ എ . എസ്
5. ചില സ്വപ്നങ്ങളിൽ സീതാലക്ഷ്മിയുടെ കുറുത്ത മുടിയിഴ - ഇന്ദുമേനോൻ

ഖണ്ഡം അഞ്ച് - 22 മണിക്കൂർ

- ആടുജീവിതം - ബന്യാമിൻ

SEMESTER I

COMPLEMENTARY COURSE I

CH1C01B18: BASIC THEORETICAL AND ANALYTICAL CHEMISTRY

Credits: 2

Total Lecture Hours: 36

Course Outcomes:

CO1: Describe the Bohr atom model, types of bonds, Valence bond and VSEPR theories and Hybridization.

CO2: Explain the periodic properties of elements and concepts of chemical equilibrium.

CO3: Identify methods for separating a given organic compound from a reaction mixture and quantification of inorganic metal ions using titrimetric and gravimetric analysis.

CO4: Differentiate between column chromatography, PC, TLC, GC, IEC and HPLC techniques.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	2	1	1
CO2	1	2	2	1	1
CO3	1	1	1	3	1
CO4	1	1	3	1	3

Syllabus Content:

Module 1 : Atomic Structure and Chemical Bonding

(12 Hrs)

Atomic Structure: Bohr atom model and its limitations, Dual nature of matter and radiation. Photoelectric effect, de Broglie equation, Heisenberg's uncertainty principle, Concept of orbital, Quantum numbers, shapes of orbitals (*s, p, d*), Electronic configuration of atoms - Aufbau principle, Hund's rule of maximum multiplicity, Pauli's exclusion principle.

Chemical Bonding: Introduction – Type of bonds. Ionic bond: Factors favouring the formation of ionic bonds. Covalent bond: Valence bond theory – Coordinate bond. VSEPR theory and examples. Hybridisation: - sp^3 , sp^2 and sp (ethane, ethene, ethyne). Intermolecular forces - Hydrogen bonding in H_2O - Dipole-dipole interactions.

Module II : Fundamental Concepts in Chemistry (9 hrs)

Periodic Properties: Modern periodic law – Long form of periodic table. Periodicity in properties: Atomic radii, ionic radii, ionization enthalpy, electron affinity (electron gain enthalpy) and electronegativity (Pauling scale). Atomic mass - Molecular mass - Mole concept – Molar volume - Oxidation and reduction – Oxidation number and valency - Equivalent mass.

Concept of Equilibrium: Acids and Bases - Arrhenius, Lowry-Bronsted and Lewis theories. Ionic product of water - pH and pOH, Strengths of acids and bases - K_a and K_b , pK_a and pK_b . Buffer solution. Solubility, solubility product, common ion effect and their applications.

Module III : Basic Principles of Analytical Chemistry (9 Hrs)

Methods of Analysis: Volumetric method of analysis - General principles. Primary and secondary standards, criteria for primary standards, preparation of standard solutions, standardization of solutions, end point. Acid base, redox and complexometric titrations and corresponding indicators. Double burette method of titration: Principle and advantages. Microanalysis and its advantages. Gravimetric method of analysis: General principles.

Reporting of Analytical Data: Precision and accuracy – Types of errors – Ways of expressing precision – Methods to reduce systematic errors.

Separation and Purification Techniques: Recrystallisation, use of drying agents, sublimation. General principles of distillation, fractional distillation, distillation under reduced pressure. Solvent extraction.

Module IV: Chromatographic Techniques (6 Hrs)

Chromatography - Principle of differential migration. Classification of chromatographic methods. Basic principle and uses of Thin layer chromatography (TLC), Paper chromatography (PC), R_f value, Column chromatography, Gas chromatography(GC), High performance Liquid chromatography (HPLC), Ion Exchange chromatography (IEC).

SEMESTER I

COMPLEMENTARY COURSE II

ZY1C01B18: NON CHORDATE DIVERSITY

Credits: 2

Total Lecture Hours: 36

Course Outcomes:

CO1: Classify Non chordates up to the level of class.

CO2: Differentiate beneficial and harmful non chordates.

CO3: Describe the ecological importance of Corals and Coral reefs.

CO4: Describe the physiological and morphological distinctiveness of Non chordates.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	1	1	1	1
CO3	1	1	1	3	1
CO4	2	1	1	1	1

Syllabus Content:

Module I

10 Hrs

Introduction: Five kingdom classification

Kingdom Protista: Salient features (any five important salient features) of each phylum with one example each (detailed account of example is not necessary).

Phylum Rhizopoda (eg: Amoeba)

Phylum Actinopoda (eg: Actinophrys)

Phylum Dinoflagellata (eg: Noctiluca)

Phylum Parabasalia	(eg: Trichonympha)
Phylum Metamonada	(eg: Giardia)
Phylum Kinetoplasta	(eg: Trypanosoma)
Phylum Euglenophyta	(eg: Euglena)
Phylum Cryptophyta	(eg: Cryptomonas)
Phylum Opalinata	(eg: Opalina)
Phylum Bacillariophyta	(eg: Diatoms)
Phylum Chlorophyta	(eg: Volvox)
Phylum Choanoflagellata	(eg: Proterospongia)
Phylum Ciliophora	(eg: Paramecium)
Phylum Sporozoa	(eg: Plasmodium)
Phylum Microsporidia	(eg: Nosema)
Phylum Rhodophyta	(eg: Red algae)

General Topic: Pathogenic Protists – Plasmodium, Entamoeba

Module II

3 Hrs

Phylum Porifera: Salient features (eg: Leucosolenia)

Phylum Coelenterata: Salient features and classification upto class.

Class 1: Hydrozoa (eg: Physalia)

Class 2: Scyphozoa (eg: Aurelia)

Class 3: Anthozoa (eg: Adamsia)

General Topic: Corals and Coral reefs.

Module III

6 Hrs

Phylum Platyhelminthes: Salient features and classification up to class.

Class 1: Turbellaria (eg: Planaria)

Class 2: Trematoda (eg: Fasciola)

Class 3: Cestoda (eg: Taenia solium)

Phylum Nematoda: Salient features and classification up to class.

Class 1: Phasmida (eg: Wuchereria)

Class 2: Aphasmida (eg: Trichinella)

Phylum Annelida: Salient features and classification up to class.

Class 1: Archiannelida (eg: Polygordius)

Class 2: Polychaeta (eg: Nereis)

Class 3: Oligochaeta (eg: Pheretima)

Class 4: Hirudinomorpha (eg: Hirudinaria)

Module IV

11 Hrs

Phylum Arthropoda: Salient features. Type study – Fennero penaeus (Penaeus) - habitat, morphology, appendages, sexual dimorphism, digestive system, respiratory system, circulatory system, excretory system, nervous system, sense organs, reproductive system and larval stages.

Classification up to class with one example each

Subphylum Trilobitomorpha

Class 1: Trilobita (Extinct) (eg: Dalmanites)

Subphylum: Chelicerata

Class 1: Merostoma (eg: Limulus)

Class 2: Arachnida (eg: Spider)

Class 3: Pycnogonida (eg: Nymphon)

Subphylum Mandibulata

Class 1: Crustacea (eg: Daphnia)

Class 2: Chilopoda (eg: Centipede)

Class 3: Symphyla (eg: Scutigera)

Class 4: Diplopoda (eg: Millipede)

Class 5: Pauropoda (eg: Pauropus)

Class 6: Insecta (eg: Butterfly)

Module V

6 Hrs

Phylum Mollusca: Salient features and classification up to class

Class 1: Aplacophora (eg: Neomenia)

Class 2: Monoplacophora (eg: Neopilina)

Class 3: Polyplacophora (eg: Chiton)

Class 4: Bivalvia (eg: Perna)

Class 5: Gastropoda (eg: Xancus)

Class 6: Cephalopoda (eg: Sepia)

Class 7: Scaphopoda (eg: Dentalium)

Phylum Echinodermata: Salient features and classification up to class.

Class 1: Asteroidea (eg: Astropecten)

Class 2: Ophiuroidea (eg: Ophiothrix)

Class 3: Echinoidea (eg: Echinus)

Class 4: Holothuroidea (eg: Holothuria)

Class 5: Crinoidea (eg: Antedon)

Phylum Hemichordata: Salient features (eg: Balanoglossus.)

SEMESTER I

CORE COURSE

BO1B01B18: METHODOLOGY OF SCIENCE AND AN INTRODUCTION TO BOTANY

Credits: 2

Total Lecture Hours:

Course Outcomes:

CO1: Interpret the methodology of scientific enquiry and experimentation considering ethical principles.

CO2: Analyze the different classificatory systems of organisms and identify the richness and importance of biodiversity.

CO3: Explain the origin of life and the course of organic evolution.

CO4: Execute the basic botanical skills and techniques.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	1	2
CO2	3	2	2	1	1
CO3	2	1	1	1	1
CO4	2	1	2	1	3

Syllabus Content:

Module 1: Introduction to Science and the methodology of science (4 hrs)

Scientific method: steps involved - observation and thoughts, formulation of hypothesis; inductive reasoning - testing of hypothesis; deductive reasoning - experimentation - formulation of theories and laws.

Module 2: Experimentation in Science

(4 hrs)

Selection of a problem - searching the literature – designing of experiments - selection of variables, study area, and a suitable design. Need of control, treatments and replication. Mendel's experiments as an example of moving from observations to questions, then to hypothesis and finally to experimentation. Ethics in science.

Module 3: Origin and Evolution of Life

(10 hrs)

Origin of life on earth from molecules to life – Oparin's hypothesis, Haldane's hypothesis, Miller- Urey experiment, Panspermia, origin of cells and the first organisms. Evidences of evolution; theories of evolution - Lamarck, Wallace, Charles Darwin, Hugo De Vries. Neo-Darwinism – major postulates - isolation, mutation, genetic drift, and speciation.

Module 4: Diversity of life and its classification

(12 hrs)

Diversity of life: two kingdom classification (Carolus Linnaeus, 1735); phylogenetic classification (August W Eichler, 1878); five kingdom classification (R H Whittaker, 1969). Three domains, six kingdom classification, (Carl Woese, 1990) – criteria for classification, general characters of each kingdom. The three domains of life: Archaea, Bacteria, Eucarya – general characters of each. Diversity of plants: study the salient morphological features of vegetative and reproductive parts of algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.

Module 5: Basic Botanical Skills

(6 hrs)

Light microscope: dissection and compound microscope – parts and uses. Preparation of specimens for light microscopy - collection and preservation of plant specimens; killing and fixing; killing agents- formalin, ethyl alcohol; fixing agents - Carnoy's fluid, Farmer's fluid, FAA. Preparation of Normal, Molal and Molar solutions.

SEMESTER II

Course Code	Course Title	Credits	Course Type
EN2A03B18	Issues That Matter	4	Common Course I
EN2A04B18	Savouring The Classics	3	
FR2A03B18	French Language And Communicative Skills – II	4	Common Course II
HN2AO3B18	Kavita , Vyakaran Aur Anuvad		
MA2A03B18	Kavitha		
CH2C01B18	Basic Organic Chemistry	2	Complementary Course I
CH2CP01B18	Volumetric Analysis	2	Complementary Course I Practicals
ZY2C01B18	Chordate Diversity	2	Complementary Course II
ZY2CP01B18	Non-Chordate And Chordate Diversity	2	Complementary Course II Practicals
BO2B02B18	Microbiology, Mycology And Plant Pathology	2	Core Course
BO2BP01B18	Methodology Of Science, Introduction To Botany, Microbiology, Mycology And Plant Pathology	2	Core Course Practical

SEMESTER II

COMMON COURSE I

EN2A03B18 - ISSUES THAT MATTER

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1. Identify the major issues of contemporary significance.

CO2. Discuss the consequences of war and refugee crisis with respect to the psychological dimension.

CO3. Employ theoretical learning in classrooms to current developments in the world.

CO4. Critique the diverse experiences both historical and contemporary to create a more informed vision of the future.

CO5. Develop oneself as a conscious, concerned, conscientious human being.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	2
CO2	1	1	1	3	2
CO3	2	2	1	2	3
CO4	1	1	1	2	2
CO5	2	2	2	3	3

Syllabus Content

Module 1

(18 hours)

“The Unsundered People” – Kenzaburo Oe

“The Old Prison” – Judith Wright

“War” – Luigi Pirandello

Module 2

(18 hours)

Persuasions on the Power of the Word:

“On Censorship” – Salman Rushdie

“Peril” – Toni Morrison

“The Burning of the Books” – Bertolt Brecht

“The Censors” – Luisa Valenzuela

Module 3

(18 hours)

“The Poisoned Bread” – Bandhu Madhav

“A Trip Westward” – Zitkala-Sa

“The Pot Maker” – Temsula Ao

Module 4

(18 hours)

“Does it Matter?” – Richard Leakey

“On Killing a Tree” – Gieve Patel

“Hagar: A Story of a Woman and Water” (Gift in Green (chapter 2)) – Sarah Joseph

Module 5

(18 hours)

“Understanding Refugeeism: An Introduction to Tibetan Refugees in India” – Mallica Mishra

“Refugee Blues” – W.H Auden

“The Child Goes to the Camp” (from Palestine’s Children) – Ghassan Kanafani

SEMESTER II

COMMON COURSE I

EN2A04B18 – SAVOURING THE CLASSICS

Credits: 3

Total Lecture Hours: 72

Course Outcomes:

CO1: Recognise the time-tested literary masterpieces from diverse cultures.

CO2: Identify the representative authors from various genres (poetry, drama, novel, short fiction).

CO3: Recite celebrated lines from Classic works.

CO4: Discuss the 'universals' of human condition.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1
CO2	1	1	1	1	1
CO3	1	1	1	2	2
CO4	1	1	1	3	2

Syllabus Content

Module 1 (Poems)

(18hours)

Homer: "Father and Son" (Odyssey Book 16: 113-189) (Translated by Robert Fagles)

Kalidasa: "Lovely is Youth" (Translated by J.G Jennings)

Omar Khayyam: Rubaiyat (quatrains: 25-28) (Translated by Edward Fitzgerald)

Dante: Dante meets Virgil (Inferno Canto 1: 49-102) (Translated by J.G Nichols)

John Milton: "On his Blindness"

Module 2 (Shakespeare Excerpts)

(18hours)

Romeo and Juliet: Act II, Scene ii

The Merchant of Venice: Act IV, Scene i

Module 3 (Novel Excerpts)

(18hours)

Miguel de Cervantes: Don Quixote (Chapter 8) (Translated by Edith Grossman)

Jane Austen: Pride and Prejudice (Chapters 1-6)

Victor Hugo: Les Miserables (Part 1- Fantine, Book II, Chapters 9-13) (Translated by Christine Donougher)

Module 4 (Short Fiction)

(18hours)

Charles Dickens: The Black Veil

Leo Tolstoy: How Much Land Does a Man Need? (Translated by Louise & Aulmer Maude)

Rabindranath Tagore: Kabuliwala (Translated by Mohammad A Quayum)

Jorge Louis Borges: The Shape of the Sword (Translated by Andrew Hurley)

SEMESTER II

COMMON COURSE II

FR2A03B18- FRENCH LANGUAGE AND COMMUNICATIVE SKILLS – II

Credit -4

Total Lecture Hours- 72

Course Outcomes:

CO1: Identify familiar everyday expressions and basic phrases.

CO2: Ask questions to get meaningful responses in effective communication.

CO3: Develop language, vocabulary and grammar skills.

CO4: Prepare conversations based on various situations.

CO5: Articulate the concepts to express one's opinion in a specific situation.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1
CO2	1	1	1	2	3
CO3	1	1	1	2	3
CO4	1	1	1	1	3
CO5	1	1	1	2	3

Syllabus Content:

Module I (25 hours)

Chambre pour étudiants Localiser des objets – l'habitat – les meubles – l'appréciation

Module II (23 hours)

Petits boulots Téléphoner – Raconter – l'emploi

Module III (24 hours)

Le resto U Exprimer une opinion – Poser des questions – la nourriture

SEMESTER II

COMMON COURSE II

HN2AO3B18 - KAVITA , VYAKARAN AUR ANUVAD

Credits – 4

Total Lecture Hours- 72

Course Outcomes:

CO1: Contextualize and Summarise the poems of different genres in Hindi.

CO2: Evaluate the Poets contribution to Hindi literature.

CO3: Demonstrate linguistic ability for translation of texts between Hindi & English.

CO4: Classify Parts of Speech.

CO5: Illustrate greater fluency in Hindi by applying theoretical knowledge of Grammar.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1
CO2	1	1	1	1	1
CO3	1	1	1	2	3
CO4	1	1	1	1	2
CO5	1	1	1	2	3

Syllabus Content

Module I (18 Hours)

Vyaakaran

Module II (20 Hours)

Tulasidas

Kabir

Ve Muskathe Phool Nahi- Mahadevi Verma

Cheenane Aaye Hain Ve – Sarweshvar Dayal Saxena

Dilli Darwaaza – Kumar Vimal

Jungle Ke Ujaad Mei – Vinod Kumar Shukla

Aazadi Urf Gulaami – Gyanendrapathi

Module III

(20 Hours)

Meera

Bazaar- Mangalesh Dabraal

Beesvi Sadi Ke Antim Dino Ka Aashcharya- Rajesh Joshi

Do Haathiyon Ki Ladaai- Uda Pakash

Thande Paani Ki Machine – Ekant Srivastav

Saboot – Arun Kamal

Tumhe Kuch Karna Chahiye – Chanrakanth Devthale

Module IV

(14 Hours)

Anuvaad

SEMESTER II

COMMON COURSE II

MA2A03B18-കവിത

ക്രെഡിറ്റ് : 4

പഠനസമയം : 72 മണിക്കൂർ

കോഴ്സ് ഔട്ട്കം (Course Outcome)

CO1.പത്തൊൻപത് കവിതകളുടെ പഠനത്തിലൂടെ വായനാശേഷിയും ആസ്വാദന പ്രാപ്തിയും കൈവരിക്കൽ.

CO2.മലയാളകവിതകളിലെ കാലാനുസൃതമായ ഭാവുകത്വപരിണാമം തിരിച്ചറിയ.

CO3.നിലവിലുള്ള സാമൂഹ്യജീവിതയാഥാർത്ഥ്യങ്ങളെ അഭിമുഖീകരിക്കാൻ പ്രാപ്തമാക്കൽ.

CO4.പരിസ്ഥിതികസൗന്ദര്യശാസ്ത്രത്തെയും ചില സാമൂഹ്യചരിത്ര പശ്ചാത്തലങ്ങളെയും കുറിച്ച് ഗ്രഹിക്കൽ.

CO5.വിദ്യാർത്ഥികളുടെ സർഗ്ഗാത്മകശേഷി വികസിക്കൽ.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	2	2
CO2	1	1	1	1	1
CO3	1	1	1	2	3
CO4	2	2	1	3	2
CO5	1	1	1	1	3

ഖണ്ഡം ഒന്ന്-

20 മണിക്കൂർ

1. മാംസനിബലമല്ല രാഗം -കുമാരനാശാൻ (ലീലയിലെ 47 മുതൽ 74 വരെയുള്ള 28 ശ്ലോകങ്ങൾ)

2.സ്നേഹസുന്ദരപാതയിലൂടെ -വൈലോപ്പിള്ളി ('കുടിയൊഴിക്കലി'ലെ അവസാന ഖണ്ഡം)

ഖണ്ഡം രണ്ട്

15 മണിക്കൂർ

1. ഒറ്റയ്ക്കിരിക്കാൻ പഠിച്ചുകഴിഞ്ഞു ഞാൻ -സുഗതകുമാരി
2. കോഴി -കടമ്മനിട്ടരാമകൃഷ്ണപിള്ള
3. പഴഞ്ചൊല്ലുകൾ -സച്ചിദാനന്ദൻ
4. മുളളൻപന്നി -കെ.ജി.ശങ്കരപ്പിള്ള

ഖണ്ഡം മൂന്ന്

15 മണിക്കൂർ

1. തിരുത്ത്-പി .പി.രാമചന്ദ്രൻ
2. പിറക്കാത്ത മകൻ -ബാലചന്ദ്രൻ ചുള്ളിക്കാട്
3. മൃഗശിക്ഷകൻ -വിജയലക്ഷ്മി
4. കുന്നിമണികൾ-കുഞ്ഞുണ്ണി

ഖണ്ഡം നാല്

22 മണിക്കൂർ

1. ആടിയടില അലഞ്ഞ മരങ്ങളേ -അൻവർ അലി
2. കൽവീട് -വി.എം.ഗിരിജ
3. ആഴങ്ങൾ അടച്ചിട്ട പുഴ -എസ് .ജോസഫ്
4. സ്മാരകം -വീരാൻകുട്ടി
5. കുട്ടമ്മാൻ -എം.ർ.രേണുകുമാർ
6. നാഷണൽ ജ്യോഗ്രഫി -എസ് .കണ്ണൻ
7. വാഴക്കുല -കെ .ആർ.ടോണി
8. പഴയ ചിലത് -പി.രാമൻ
9. ഗോതമ്പുശിലും -കവിത ബാലകൃഷ്ണൻ

SEMESTER II

COMPLEMENTARY COURSE I

CH2C01B18: BASIC ORGANIC CHEMISTRY

Credits – 2

Total Lecture Hours: 36

Course Outcomes

CO1: Apply the IUPAC nomenclature to name and write the structure of organic compounds including stereoisomers.

CO2: Explain the types of reagents, reactive intermediates, reaction mechanisms and the corresponding influencing factors in organic chemistry.

CO3: Explain stereoisomerism in organic chemistry.

CO4: Explain the classification, structure, properties, methods of preparation, uses and environmental toxicity of polymers.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	1	3
CO2	1	2	2	2	3
CO3	1	3	2	2	2
CO4	1	3	2	3	2

Syllabus Content

Module 1: Fundamental Concepts of Organic Chemistry (9 hrs)

Introduction: Origin of organic chemistry – Uniqueness of carbon – Homologous series. IUPAC nomenclature of alkyl halides, alcohols, aldehydes, ketones, carboxylic acids and amines. Structural isomerism: Chain isomerism, position isomerism, functional isomerism, metamerism and tautomerism. Bond fission - homolytic and heterolytic fission. Types of reagents -

Electrophiles and nucleophiles. Polarity of bonds. Reaction Intermediates: Carbocations, carbanions and free radicals (Structure and stability). Types of organic reactions: Addition, Elimination, Substitution and Rearrangement (definition and one example each).

Module II: Mechanisms of Organic Reactions (9 hrs)

Meaning of reaction mechanism. Polarity of bonds. Electron Displacement Effects: Inductive effect - Definition - Examples - +I and -I groups. Applications: Explanation of substituent effect on the acidity of aliphatic carboxylic acids. Mesomeric effect: Definition – Characteristics - +M and -M groups, Applications. Hyperconjugation: Definition – Characteristics. Applications: Baker-Nathan effect, Comparison of stability of 2-methyl-1-butene & 2-methyl-2-butene. Steric effect (causes and simple examples).

Substitution reactions: nucleophilic substitution of alkyl halides- S_N1 and S_N2 mechanisms. Electrophilic substitutions in benzene.

Addition reactions: Electrophilic addition to alkene - Markwonikoff's rule, Peroxide effect.

Elimination reactions: E1 and E2 mechanisms. (General mechanism is only needed)

Module III: Stereochemistry of Organic Compounds (9 hrs)

Stereoisomerism – definition, classification.

Geometrical Isomerism: Definition – Condition – Geometrical isomerism in but-2-ene and but-2-ene-1,4-dioic acid. cis and trans, *E* and *Z* configurations. Methods of distinguishing and interconversion of geometrical isomers.

Conformations: Newman projection, Saw-horse projection. Conformations of ethane.

Optical Isomerism: Optical activity – Chirality – Enantiomers - Meso compounds - Diastereoisomers – Optical isomerism in lactic acid and tartaric acid - Racemisation and resolution (elementary idea only).

Module IV: Natural and Synthetic Polymers (9 hrs)

Introduction. Classification of polymers: Natural, synthetic; linear, cross-linked and network; plastics, elastomers, fibres; homopolymers and copolymers. Polymerization reactions. Typical

examples: Polyethylene, polypropylene, PVC, phenol-formaldehyde and melamine-formaldehyde resins, polyamides (nylons) and polyesters. Natural rubber: structure, latex processing methods, vulcanization and uses. Synthetic rubbers: SBR, nitrile rubber and neoprene. Biodegradability of polymers, environmental hazards.

SEMESTER II

COMPLEMENTARY COURSE I

CH2CP01B18: VOLUMETRIC ANALYSIS (PRACTICAL)

Credits – 2

Total Hours: 72 (36 + 36)

Course Outcomes:

CO1: Prepare standard solutions for microscale volumetric analysis.

CO2: Record the molarity of the given intermediate solution by standardizing it.

CO3: Calculate the mass of the analyte in a given solution by microscale volumetric analysis.

CO4: Administer microscale analysis of solutions by different types of volumetry like acidimetry, alkalimetry, permanganometry, dichrometry, iodometry and iodimetry.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	3
CO2	1	3	2	2	3
CO3	1	3	2	2	3
CO4	1	3	2	2	3

Syllabus Content

Standard solution must be prepared by the student.

1. Acidimetry and Alkalimetry

1. Standardization of HCl with standard Na_2CO_3 solution
2. Standardization of NaOH with standard oxalic acid solution
3. Estimation of any acid using standard NaOH
4. Estimation of any alkali using standard HCl.

2. Permanganometry

1. Standardization of KMnO_4 using (i) oxalic acid (ii) Mohr's salt
2. Estimation of Fe^{2+} in Mohr's salt and crystalline Ferrous Sulphate using standard KMnO_4 .

3. Dichrometry

1. Estimation of Ferrous ions (external indicator)
2. Estimation of Ferrous ions (internal indicator)
3. Estimation of $\text{FeSO}_4 \cdot 7 \text{H}_2\text{O}$ (external indicator)

4. Iodimetry and Iodometry

1. Standardization of Iodine solution
2. Standardization of Sodium thiosulphate
3. Estimation of KMnO_4
4. Estimation of Copper

SEMESTER II

COMPLEMENTARY COURSE II

ZY2C01B18: CHORDATE DIVERSITY

Credits : 2

Total Lecture Hours: 36

Course Outcome

CO1: Explain the classification of the higher groups of animal kingdom.

CO2: Differentiate the characteristics, systems and identify the chordate phyla.

CO3: Distinguish the economically important vertebrates.

CO4: Summarize the adaptations in various classes of chordates.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	2	2
CO2	2	3	1	2	2
CO3	3	2	1	2	2
CO4	2	3	2	2	2

Syllabus Content

Module I

(4 Hrs)

Phylum Chordata: Fundamental characters and outline classification upto class.

Sub phylum Urochordata:

General characters, Classification:

Class 1: Larvacea (eg: Oikopleura)

Class 2: Ascidiacea (eg: Ascidia), Retrogressive metamorphosis.

Class 3: Thaliacea (eg: Salpa)

Sub phylum Cephalochordata: Salient features (eg: Branchiostoma)

Module II

(6 Hrs)

Sub phylum Vertebrata: Salient features

Division Agnatha: salient features and classification

Class 1: Cyclostoma (eg: Petromyzon)

Class 2: Class Ostracodermi (eg: Cephalopsis)

Division Gnathostomata: Salient features Super class Pisces

Super class Tetrapoda.

Super class Pisces: Salient features and classification

Class 1: Chondrichthyes (eg: Narcine)

Class 2: Osteichthyes (eg: Latimeria)

General Topic: Accessory respiratory organs in fishes.

Module III

(14 Hrs)

Super class Tetrapoda: Salient features

Class 1: Amphibia: Salient features. Type study: *Euphyctis hexadactyla* - Habitat, morphology, sexual dimorphism, coelom and viscera, skeletal system, digestive system, respiratory system, circulatory system, excretory system, nervous system, sense organs, reproductive system, development.

Classification up to order:

Order 1: Urodela (eg: Amblystoma)

Order 2: Anura (eg: Bufo)

Order 3: Apoda (eg: Ichthyophis)

Module IV

(6 Hrs)

Class Reptilia: Salient features and classification up to subclass

Sub class 1: Anapsida (eg: Chelone)

Sub class 2: Diapsida (eg: Chamaeleon)

Sub class 3: Parapsida (eg: Ichthyosaurus)

Sub class 4: Synapsida (eg: Cynognathus)

General Topics: Poisonous and non poisonous snakes of Kerala.

Class Aves: Salient features and classification up to subclass

Sub class Archeornithes (eg: Archaeopteryx)

Sub class Neornithes (eg: Struthio)

General Topics: Flight adaptation of birds

Module V

(6 Hrs)

Class Mammalia: Salient features and classification up to subclass

Sub class 1: Protheria (eg: Echidna)

Sub class 2: Metatheria (eg: Macropus)

Sub class 3: Eutheria (eg: Elephas)

General Topic: General adaptation of aquatic mammals with example.

SEMESTER II

COMPLEMENTARY COURSE II

ZY2CP01B18: NON CHORDATE AND CHORDATE DIVERSITY(PRACTICAL)

Credits : 2

No. of Hours: 72 (36 + 36)

Course Outcome

CO1: Dissect the prawn and cockroach nervous system and distinguish the body parts of non-chordates and chordates.

CO2: Distinguish the characteristics and identify the non-chordates and chordates.

CO3: Classify the various non-chordate and chordate phyla.

CO4: Illustrate the non-chordates.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	1	2
CO2	3	3	1	1	2
CO3	3	3	1	1	2
CO4	3	3	1	1	2

SEMESTER I

COMPLEMENTARY COURSE- PRACTICAL 1

NON-CHORDATE DIVERSITY

Syllabus Content

1. Scientific drawing - 5 specimens
2. Simple identification - 10 invertebrates, out of which 5 by their scientific names
3. T.S - Earthworm, T.S Fasciola
4. Dissection - Nervous system of Prawn
5. Dissection - Nervous system of Cockroach
6. Mounting - Prawn Appendages

SEMESTER II
COMPLEMENTARY COURSE – PRACTICAL 2
CHORDATE DIVERSITY

Syllabus Content

1. Simple identification of 10 chordates, out of which 5 by their scientific names
2. Osteology - Vertebrae and girdles of Frog
3. Snake identification - 3 poisonous and 3 non poisonous snakes with key
4. Mounting of placoid scales of shark
5. Dissections: Frog: Photographs/Diagrams/ models may be used for the study.
 1. Frog - Viscera
 2. Frog - Digestive System
 3. Frog - Arterial System
 4. Frog – Brain

SEMESTER II
CORE COURSE

BO2B02B18: MICROBIOLOGY, MYCOLOGY AND PLANT PATHOLOGY

Credits : 2

Total Lecture Hours: 36

Course Outcomes:

CO1: Analyse the morphological and ultrastructural features of bacteria, viruses fungi and lichens.

CO2: Recognise the process of isolation and culturing of bacteria based on their morphology.

CO3: Analyse the various adaptive strategies of the bacteria, viruses, fungi and lichens through phylogenetic line of evolution.

CO4: Explain the ecological, economic and pathologic importance of microorganisms.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	1	2
CO2	3	2	2	1	2
CO3	3	1	2	1	1
CO4	3	1	2	3	2

Syllabus Content:-

MICROBIOLOGY (Theory 9 hrs; Practical 9 hrs)

Module 1: Introduction, Bacteria and Viruses (7 hrs)

Introduction to microbiology, scope of microbiology.

Bacteria: general characters and classification based on staining, morphology and flagellation. Ultra-structure of bacteria. Reproduction - binary fission. Genetic recombination in bacteria - conjugation, transformation and transduction. Economic importance of bacteria.

Viruses: General characters of viruses, virioids and prions. Structure of TMV and Bacteriophage (λ). Multiplication of λ phage – lytic and lysogenic cycle.

Module 2: Applied Microbiology (2 hrs)

Isolation and culture of bacteria; media used – general purpose and selective media, applications of bacterial culture (brief study only). Role of microbes: in producing antibiotics, wine, vinegar, curd – role in N₂ fixation, as biofertilizers – role in food spoilage (Brief study only).

MYCOLOGY (Theory 16 hrs; Practical 18 hrs)

Module 3: Introduction, classification and type study. (13 hrs)

General characters of fungi. Classification of fungi - Ainsworth (1973). Distinguishing characters of the different classes of fungi with special reference to reproductive structures and life history of the genera mentioned in each group:

Myxomycotina – *Physarum*; Mastigomycotina – *Albugo*; Zygomycotina - *Rhizopus*; Ascomycotina – Hemiascomycetes - *Saccharomyces*; Plectomycetes - *Penicillium*; Pyrenomycetes – *Xylaria*; Discomycetes - *Peziza*; Basidiomycotina – Teliomycetes – *Puccinia*; Hymenomycetes – *Agaricus*; Deuteromycotina – *Fusarium*.

Economic importance of Fungi (3 hrs)

Useful and harmful effects of fungi - medicinal, industrial, agricultural, food, genetic studies, spoilage, fungal toxins and diseases. Mycorrhiza: ecto- and endomycorrhiza. Significance.

Module 4: Lichens (2 hrs)

General characters, types, general internal structure. Economic and ecological significance of lichens. Structure, reproduction and life cycle of *Parmelia*.

PLANT PATHOLOGY (Theory 9 hrs; Practical 9 hrs)

Module 5: Plant disease development, Common plant diseases and Control of diseases

History of plant pathology. Classification of plant diseases on the basis of causative organism

and symptoms. Host parasite interaction - defense mechanisms in host, mechanism of infection, transmission and dissemination of diseases.

Common plant diseases: Study of following diseases with emphasis on symptoms, cause, disease cycle and control: Bunchy top of Banana, Bacterial blight of Paddy, Root wilt of Coconut, Abnormal leaf fall of Rubber, Root knot disease of Pepper, Leaf mosaic disease of Tapioca, Citrus canker.

Control of diseases: Prophylaxis - quarantine measures, seed certification; Therapeutic - physical therapy, chemotherapy; Biological control and its significance. Preparation and application of fungicides - Bordeaux mixture; Biopesticides - Tobacco and Neem decoction

SEMESTER II

CORE COURSE

**BO2BP01B18 - METHODOLOGY OF SCIENCE, INTRODUCTION TO BOTANY,
MICROBIOLOGY, MYCOLOGY AND PLANT PATHOLOGY (PRACTICAL)**

Credits : 2

Total Lecture Hours: 72 (36+36)

Course Outcomes:

CO1: Determine the distinctive features of plant groups and separate them to groups in the plant kingdom using morphological and reproductive features.

CO2: Develop an experiment and verify the validity of any given hypothesis to infer the different elements of scientific enquiry.

CO3: Develop skills in basic microbiological techniques and prepare micro preparations of fungal specimens for identification.

CO4: Identify plant diseases that affect crops based on symptoms and provide environment friendly preventive and remedial measures.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	2	3
CO2	3	1	2	2	3
CO3	3	1	2	2	1
CO4	3	2	2	3	3

SEMESTER I

CORE COURSE- PRACTICAL 1

METHODOLOGY OF SCIENCE AND AN INTRODUCTION TO BOTANY

PRACTICAL (36 hrs)

1. Design an experiment to verify a given hypothesis.
2. To identify and collect plant specimens to appreciate the diversity of plant kingdom.
3. Submit five preserved specimens (in bottles and/or herbarium) belonging to diverse groups.
4. Conduct a survey-based inquiry on a given topic (To test the validity of a given hypothesis. E.g., all angiosperm parasites are Dicot plants).
5. Select an important classical experiment and find out the different elements of the methodology of science (e.g., Robert Koch experiment).
6. Conduct field surveys plants with vascular elements, plants which produce flowers, fruits, seeds, cone, sporophyll, embryos and study their salient features.
7. Prepare temporary, stained hand sections (TS) of plant specimens appropriate for light microscopic studies.

SEMESTER II

CORE COURSE 2 - Practical

MICROBIOLOGY, MYCOLOGY AND PLANT PATHOLOGY

Practicals: 36 hrs

Microbiology - (9 hrs)

1. Gram staining - curd, root nodules.
2. Isolation of microbes from soil through serial dilution and streak plate method.
3. Demonstrate the culture of bacteria.
Microbes and type of fermentation - vine, vinegar, curd.

Mycology (18 hrs)

1. Micropreparation and detailed microscopic study of *Rhizopus*, *Albugo*, *Saccharomyces*, *Penicillium*, *Xylaria*, *Peziza*, *Puccinia*, *Fusarium* and *Parmelia*.
2. Staining and microscopic observation of endomycorrhizal fungus.
3. Investigation of fungal succession on cow dung.

Plant Pathology (9 hrs)

1. Identify the diseases mentioned in the syllabus with respect to causative organisms and symptoms
2. Submit herbarium preparations of any three of the diseases mentioned.

Learn the technique of preparing Bordeaux mixture, Tobacco and Neem decoction

SEMESTER III

Course Code	Course Title	Credits	Course Type
EN3A05B18	Literature and/as Identity	4	Common Course I
FR3A05B18	An Advanced Course in French -I	4	Common Course II
HN3A05B18	Naatak Aur Lambi Kavita		
MA3A05B18	Drisyakalasaahithyam		
CH3C01B18	Inorganic and Organic Chemistry	3	Complementary Course I
ZY3C01B18	Physiology and Immunology	3	Complementary Course II
BO3B03B18	Phycology and Bryology	3	Core Course II

SEMESTER III

COMMON COURSE I

EN3A05B18 – LITERATURE AND/AS IDENTITY

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1: Explain how literature problematizes identity.

CO2: Analyze the quest for identity in the Indian diaspora.

CO3: Illustrate the effects of partition and communal violence in South Asian Literature.

CO4: Critique the social construction of identity.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO	PSO5
CO1	2	2	1	3	1
CO2	2	2	1	1	3
CO3	2	2	2	1	3
CO4	2	1	2	1	3

Syllabus Content:-

Module 1 (Diasporic Identities)

(18 hours)

Agha Shahid Ali: Postcard from Kashmir

Amy Tan: Mother Tongue

Imtiaz Dharker: At the Lahore Karhai

Chitra Banerjee Divakaruni: Indian Movie, New Jersey

Module 2 (South Asian Identities)

(18 hours)

Sadat Hassan Manto: The Dog of Tetwal
Intizar Hussain: A Chronicle of Peacocks
Selina Hossain: Fugitive Colours
Punakante Wijenaik: That Deep Silence

Module 3 (Life Writings)

(18 hours)

Malcolm X: —Nightmare, excerpt from *The Autobiography of Malcolm X*.
Sashi Deshpande: Learning to be a Mother in *Janani— Mothers, Daughters, Motherhood*, (Ed.) Rinki Bhattacharya.

Module 4 (Indigenous Identities)

(18 hours)

Leslie Marmon Silko: Lullaby
Garhwali Songs in Painted Words- An Anthology of Tribal Literature – Edited
by G.N. Devy
Mamang Dai: Pinyar the Widow (Excerpt from Legends of Pensam)

Module 5 (Alter Identities)

(18 hours)

Nathaniel Hawthorne: The Birth Mark
Girish Karnad: Hayavadana (Excerpt)
Ruskin Bond: The Girl on the Train

SEMESTER III

COMMON COURSE II

FR3A05B18- AN ADVANCED COURSE IN FRENCH - I

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1: Describe topics such as physical appearance of a person, sports and entertainments.

CO2: Articulate the concepts to express ones opinion in a specific situation.

CO3: Compose conversations based on scenarios which help while shopping.

CO4: Articulate the concepts to give advice and instructions and to invite a person in a specific situation.

CO5: Construct conversations based on scenarios which help during medical and health consultations.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2
CO2	2	2	2	2	3
CO3	1	1	1	1	1
CO4	2	2	2	2	3
CO5	1	1	1	1	1

Syllabus Content:

Module I (30 hours)

Jeunes artistes: Décrire une personne - Exprimer une opinion - La description physique - Les spectacles

Module II (30 hours)

Tenue de soirée : Inviter - Les vêtements - Les chaussures - Les couleurs - Les matières

Module III (30 hours)

Faites du sport ! : Donner des conseils - Les parties du corps - Les mouvements - Les sports

SEMESTER III

COMMON COURSE II

HN3AO5B18 - NAATAK AUR LAMBI KAVITHA

Credits – 4

Total Lecturer Hours - 90

Course Outcomes:

CO1: Summarise the poems and illustrate the socio-political and cultural concerns of the Author.

CO2: Discuss the Authors contribution to Hindi Literature.

CO3: Analyse the characterisation of the Drama Konark.

CO4: Critique excerpts of the poems and Drama.

CO5: Communicate in oral and written form of Hindi with competence.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	2	3
CO2	1	2	2	2	2
CO3	2	1	2	2	3
CO4	2	2	2	1	3
CO5	2	2	1	1	3

Syllabus Content:-

Module- I

22 Hours

Syllabus- Konark Introduction & Act 1 (Jagdishchandra Mathur)

Module- II

24 Hours

Syllabus- - Konark Act 2 & 3(Jagdishchandra Mathur)

Module- III

22 Hours

Syllabus-

Nagayi Mahura (Thrilochan)

Shahenshah Ki Neend (Umashankar Chaudhary)

Dhaaba- Nilesh Raghuvanshi

Module- IV

22 Hours

Syllabus-

Ithni Door Mat Bhyahna Baba- Nirmala Putul

Jawahar Tunnel – Agnishekhar

സെമസ്റ്റർ : മൂന്ന്

കോമൺ കോഴ്സ് മലയാളം

ബി.എ/ബി.എസ്.സി (റഗുലർ), ബി.എസ്.സി സൈക്കോളജി (സ്വാശ്രയം)

MA3A05B18- ദൃശ്യകലാസാഹിത്യം

Credits: 4

Total Lecture hours: 90

പഠനനേട്ടങ്ങൾ (Course Outcomes)

CO1:കേരളീയരംഗകലാപാരമ്പര്യവും സംസ്കാരപരിണാമവും ചർച്ചചെയ്യുക

CO2:ദൃശ്യകലാപഠനത്തിലൂടെ കേരളീയസംസ്കാരപരിണാമം, ചരിത്രം എന്നിവ അപഗ്രഥിക്കുക

CO3:കഥാപാത്രപഠനത്തിലൂടെ സമകാലികവിഷയങ്ങളെ വിലയിരുത്തുക

CO4: ഇതിവൃത്ത പഠനത്തിലൂടെ കഥാപാത്രങ്ങളെ വിമർശനാത്മകമായി നിരൂപണം ചെയ്യുക

CO5:സമകാലികസംഭവങ്ങളെ അടിസ്ഥാനമാക്കി നാടകം, ഹൃസ്വചിത്രം എന്നിവ തയ്യാറാക്കുക.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	3	1
CO2	2	1	2	2	3
CO3	1	2	2	2	3
CO4	2	1	1	2	3
CO5	2	1	2	2	2

പാഠഭാഗങ്ങൾ

ഖണ്ഡം ഒന്ന് - സംസ്കൃത നാടകം 20 മണിക്കൂർ.

മലയാളശാക്തളം നാലാമകം - എ. ആർ രാജ രാജ വർമ

ഖണ്ഡം രണ്ട് - ആട്ടക്കഥ 15 മണിക്കൂർ

നളചരിതം (ഒന്നാം ദിവസം) - ഉണ്ണായി വാര്യർ (തുടക്കം മുതൽ ഹംസം നളനിലുള്ള പ്രണയം ഉറപ്പിക്കുന്നത് വരെ)

ഖണ്ഡം മൂന്ന് - തുള്ളൽ 15 മണിക്കൂർ

കല്യാണസൗഗന്ധികം (ശീതകൻ തുള്ളൽ) - കുഞ്ചൻ നമ്പ്യാർ - (ഭീമൻറെ കദളീവന പ്രവേശം മുതൽ ശ്രീരാമ ഭാസൻറെ വംശേ ജനിക്കയാൽ പാരം നിനക്കു മഹംഭാവമിങ്ങനെ' വരെ ഭാഗങ്ങൾ

ഖണ്ഡം നാല് - മലയാള നാടകം 20 മണിക്കൂർ

1128 ൽ ക്രൈം 27 - സി. ജെ. തോമസ്

ഖണ്ഡം അഞ്ച് - സിനിമ 20 മണിക്കൂർ

നിർമാല്യം തിരക്കഥ - എം. ടി. വാസുദേവൻ നായർ

SEMESTER III

COMPLEMENTARY COURSE

CH3C01B18: INORGANIC AND ORGANIC CHEMISTRY

Credits: 3

Total lecture hours - 54 hrs

Course Outcomes:

CO1: Explain the nuclear stability, fission and fusion processes and applications of radioactive isotopes.

CO2: Summarize the biochemical reactions taking place during photosynthesis and respiration and the role of metal ions in biological processes.

CO3: Explain the classification, uses and toxic effects of drugs, cosmetics, food additives, fertilizers and pesticides.

CO4: Illustrate the preparation, properties, structure and aromaticity of furan, pyrrole and pyridine.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	2	2
CO2	2	3	2	3	2
CO3	2	3	2	3	2
CO4	1	3	2	2	2

Syllabus Content:

Module I : Nuclear Chemistry (12 Hrs)

Nuclear Stability - Mass defect, Binding energy, Nuclear forces, Magic number, Packing fraction, n/p ratio. Natural and induced radioactivity, radioactivity – detection, Units of radioactivity.

Modes of decay – Group displacement law. Isotopes, isobars and isotones with examples. Nuclear fission - Atom bomb – Nuclear fusion – Hydrogen bomb - Nuclear reactors - Nuclear reactors in India. Application of radioactive isotopes – ^{14}C dating – Rock dating – Isotopes as tracers – Radio diagnosis and radiotherapy.

Module II: Bioinorganic Chemistry and Agricultural Chemistry (18 Hrs)

Bioinorganic Chemistry: Thermodynamics of Living cell- Exergonic and endergonic reactions. Metal ions in biological systems - Biochemistry of iron – Metalloporphyrins - Haemoglobin and myoglobin, pH of blood, cytochromes, Ferredoxine - Mechanism of O_2 and CO_2 transportation - Chlorophyll and photosynthesis (mechanism not expected) elementary idea of photophosphorylation. Photosynthesis and respiration – comparison. – Elementary idea of structure and mechanism of action of sodium potassium pump. Biochemistry of zinc and cobalt.

Chemistry and Agriculture: Fertilizers - NPK, superphosphates, triple super phosphate, uses of mixed fertilizers, micronutrients and their role, bio-fertilizers, plant growth hormones.

Pesticides - Classifications with simple examples, Biopesticides. Insecticides – stomach poisons, contact insecticides, fumigants. Method of preparation and use of DDT. Herbicides - function of 2, 4,-D and 2,4,5 -T, Fungicides - inorganic and organic- Bordeaux mixture. Excessive use of pesticides – environmental hazards.

Module III : Heterocyclic Compounds (8 Hrs)

Aromaticity – Huckel's rule, preparation (any one method), properties, structure and aromaticity of furan, pyrrole and pyridine.

Module IV: Drugs (8 Hrs)

Classification of drugs. Structure, therapeutic uses and mode of action (synthesis not required) of Antibiotics: Ampicillin, Sulpha drugs: Sulphanilamide, Antipyretics: Paracetamol, Analgesics: Aspirin, Antacids: Ranitidine, Antimalarials: Chloroquine and Anti-cancer drugs: Chlorambucil. Psychotropic drugs: Tranquilizers, antidepressants and stimulants with examples. Drug addiction and abuse. Prevention and treatment.

Module V: Food Additives and Cosmetics (8 Hrs)

Food Additives: Food preservatives, artificial sweeteners, flavours, emulsifying agents, antioxidants, leavening agents and flavour enhancers (definition and examples, structures not required) – Structure of BHT, BHA and MSG - Commonly used permitted and non-permitted food colours (structures not required) - Fast foods and junk foods & their health effects – Soft drinks and their health effects.

Cosmetics: Introduction. Dental cosmetics, Shampoos, Hair dyes, Skin products, Shaving cream, Talcum powder, Perfumes and Deodorants (health effects).

SEMESTER III
COMPLEMENTARY COURSE
ZY3C01B18: PHYSIOLOGY AND IMMUNOLOGY

Credits – 3

Total Lecture Hours: 54

Course Outcomes:

CO1: Illustrate the basic concepts and disorders of nutrition, circulation, respiration.

CO2: Compare the physiology and disorders of excretory, muscular and nervous system.

CO3: Summarize the role of endocrine system in maintaining homeostasis.

CO4: Distinguish immunological concepts, Immune disorders and application of antigen antibody reactions.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO	PSO3	PSO4	PSO5
CO1	2	3	2	2	2
CO2	2	3	2	2	2
CO3	2	3	2	2	2
CO4	2	3	2	2	2

Syllabus Content

Module I

(14 Hrs)

Nutrition: Types of nutrition – autotrophy, heterotrophy. Nutritional requirements – carbohydrates, proteins, lipids, minerals (Ca, Fe, I), vitamins (sources and deficiency disorders), nutritional disorders

Respiration: Transport of respiratory gases in blood - transport of oxygen, transport of carbon dioxide, chloride shift. Respiratory disturbances – Hypoxia, Hypercapnia, Asphyxia, physiological effect of smoking, carbon monoxide poisoning.

Circulation: Composition and functions of blood. Plasma and formed elements - WBC, RBC and platelets, Mechanism of blood coagulation – clotting factors, intrinsic and extrinsic pathways, anticoagulants. ECG, Blood pressure, Arteriosclerosis, Hemophilia, cerebral and pulmonary thrombosis.

Module II

(14 hrs)

Excretion: Structure of a nephron. Urine formation – glomerular filtration, tubular reabsorption, tubular secretion. Urine concentration – counter current mechanism. Composition of urine –normal and abnormal constituents. Hormonal regulation of kidney function. Kidney stone, dialysis.

Neuro physiology: Structure of a neuron. Myelinated and non myelinated nerve fibre, nerve impulse production (resting membrane potential, action potential), Impulse propagation, All or none law, saltatory conduction, synaptic transmission. Neurotransmitters (acetyl choline, adrenalin, dopamine), brain waves, EEG. Neural disorders - Parkinson's disease, Alzheimer's disease.

Muscle physiology: Types of muscles: striated, non striated and cardiac. Ultra structure of striated muscle, Mechanism of muscle contraction, Cori cycle and muscle relaxation. Muscle fatigue, oxygen debt, Rigor mortis.

Module III

(8 hrs)

Endocrinology: Introduction to Endocrine system. Mechanism of hormone action, Endocrine glands - hypothalamus, pituitary gland, pineal gland, thyroid gland, parathyroid gland, endocrine pancreas, adrenal gland, thymus gland, testis and ovary. Physiological role of hormones, Hormonal disorders.

Module IV

(12 Hrs)

Immunology: Introduction to immunology, types of immunity – innate, acquired, passive, active, mechanism of innate immunity (barriers, inflammation, phagocytosis). Types of antigens. Basic

structure of immunoglobulins, Classes of immunoglobulins and functions. Antigen antibody reactions, Precipitation test, agglutination test, WIDAL, VDRL, HIV test (ELISA)

Module V

(6 Hrs)

Immune response system: (Brief accounts of the followings) Primary and secondary lymphoid organs, Cells of Immune system - T&B lymphocytes, natural killer cells, macrophages, plasma cells, memory cells, Monoclonal antibodies, Hybridoma technology.

Immune disorders: Hypersensitivity, Auto immunity (rheumatoid arthritis) & Immunodeficiency (AIDS), Vaccines - BCG, DPT, Polio vaccine.

SEMESTER III

CORE COURSE

BO3B03B18: PHYCOLOGY AND BRYOLOGY

Credits – 3

Total Lecture Hours: 54

Course Outcomes:

CO1: Identify the different types of algae and bryophytes based on the characteristics and general features.

CO2: Explain the salient features of algae and bryophytes based on their basic characters such as habitat, range of thallus, life cycle etc.

CO3: Analyze the significance of algae and bryophytes.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	1	1
CO2	3	1	2	2	1
CO3	2	1	2	3	3

Syllabus Content:-

PHYCOLOGY

Module 1: Introduction to Phycology and Classification of Algae (9 hrs)

Introduction: general characters, habitat diversity, range of thallus structure and pigments in algae; structure of algal flagella. Different types of life cycle and alternation of generations in algae. Classification: by Fritsch (1945); brief introduction to the modern classification by Lee (2009) [up to divisions].

Module 2: Type Study (18 hrs)

Salient features, thallus structure and reproduction of algae in the following groups with special reference to the type(s) mentioned: Cyanophyceae - *Nostoc*; Chlorophyceae - *Volvox*,

Oedogonium, Cladophora, Chara; Xanthophyceae – Vaucheria; Bacillariophyceae - Pinnularia; Phaeophyceae – Ectocarpus, Sargassum; Rhodophyceae - Polysiphonia.

Module 3: Artificial Culture and Economic Importance of Algae (9 hrs)

Algal culture: isolation, cultivation and preservation of micro- and macro-algae. Economic importance of algae: algae as food, SCP, fodder, green manure, role in N₂ fixation, medicine and biofuels. Commercial products from Algae - carrageenin, agar-agar, alginates and diatomaceous earth. Role of algae in pollution studies: as indicators of pollution and as bioremediation agents. Eutrophication – algal bloom; harmful and toxic algal blooms – neurotoxins and parasitic algae.

BRYOLOGY

Module 4: General Introduction and Classification of Bryophytes (6 hrs)

Introduction, general characters and classification of bryophytes by Rothmaler (1951); a very brief account of systems and classifications by Goffinet *et al* (2008).

Economic importance of Bryophytes – biological, ecological, medicinal and as potting material.

Module 5: Type Study (12 hrs)

Distribution, morphology, anatomy, reproduction and life cycle of the following types (developmental details are not required): Hepaticopsida - *Riccia, Marchantia*; Anthocerotopsida *Anthoceros*; Bryopsida - *Funaria*. Evolution of gametophyte and sporophyte among Bryophytes

SEMESTER IV

Course Code	Course Title	Credits	Course Type
EN4A06B18	Illuminations	4	Common Course I
FR4A06B18	An Advanced Course in French -II	4	Common Course II
HN4A06B18	Gadya Aur Ekanki		
MA4A06B18	Malayala Gadhyarachanakal		
CH4C01B18	Advanced Bio-Organic Chemistry	3	Complementary Course I
CH4CP01B18	Organic Chemistry Practical	2	Complementary Course I
ZY4C01B18	Applied Zoology	3	Complementary Course II
ZY4CP01B18	Physiology, Immunology and Applied Zoology (Practical)	2	Complementary Course II
BO4B04B18	Pteridology, Gymnosperms and Paleobotany	3	Core Course
BO4BP02B18	Phycology, Bryology, Pteridology, Gymnosperms and Paleobotany	2	Core Course

SEMESTER IV
COMMON COURSE VI
EN4A06B18 – ILLUMINATIONS

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1. Discover life lessons through the study of life sketches.

CO2. Explain multiple perspectives of life from the viewpoint of great minds.

CO3. Apply the language skills acquired in academic and non-academic contexts.

CO4. Analyze creative texts with a special focus on human emotions and the spirit of survival.

CO5. Critique the conventional notions of happiness, courage and failure.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	1	3	1
CO2	2	2	2	3	1
CO3	1	1	1	1	3
CO4	3	2	2	2	1
CO5	2	1	3	2	1

Syllabus Content:-

Module 1- Life Sketches

(18 hours)

Helen Keller: Three Days to See

Jesse Owens: My Greatest Olympic Prize

Thus Spoke Sudarshan: An Interview with God's Own Physicist Compiled from E C G
Sudarshan's interviews

Module 2- Essays (18 hours)

Stephen Leacock: Are the Rich Happy?

A.G. Gardiner: On Courage

Module 3- Speeches (18 hours)

Lafcadio Hearn: On Reading

J.K. Rowling: The fringe benefits of failure and the importance of imagination

Chimamanda Ngozi Adichie: An Ode to Makeup

Module 4- Short Stories (18 hours)

Oscar Wilde: The Nightingale and the Rose

George Orwell: Roucolle, the Miser

John Galsworthy: Quality

Alice Walker: Everyday Use

Module 5- Poems (18 hours)

William Ernest Henley: Invictus

Robert Frost: The Road Not Taken

Kahlil Gibran: Of Good and Evil

Maya Angelou: Still I Rise

SEMESTER IV

COMMON COURSE II

FR4A06B18 AN ADVANCED COURSE IN FRENCH II

Credits: 4

Total Lecture Hours: 90 hours

Course Outcomes:

CO1: Develop language, vocabulary and grammar skills.

CO2: Prepare conversations based on various situations and speak about them.

CO3: Articulate the concepts to express one's opinion in a specific situation.

CO4: Ask questions to get meaningful responses in effective communication.

CO5: Describe events or topics based on various daily life situations such as persons, family, time schedules, visiting countries.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	1	3
CO2	2	1	2	1	3
CO3	2	1	2	1	3
CO4	2	2	2	3	2
CO5	2	2	2	3	2

Syllabus Content:

Module I : En voiture Proposer – Accepter – Refuser – Faire des projets- Les routes – La voiture (30 Hours)

Module II : Sur la route Exprimer l'obligation/ L'interdiction – La météo– Le temps (30 Hours)

Module III : Raconter un emploi du temps Se justifier – Le tourisme - Les pays et les continents (30 Hours)

SEMESTER IV
COMMON COURSE II
HN4AO6B18 - GADYA AUR EKAANKI

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1: Discuss the authors contribution to Hindi Literature.

CO2: Summarise the central theme and other relevant details of all literary works.

CO3: Illustrate the socio-political and cultural concerns of the Author.

CO4: Critique excerpts of the Prose and One Act Plays.

CO5: Communicate in oral and written form of Hindi with competence.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	1
CO2	2	2	2	3	1
CO3	1	2	2	2	3
CO4	1	1	2	2	1
CO5	1	2	2	2	3

Syllabus Content:

Module- I

(22hrs)

1. Aaiye hum vriksh devta ki aaradhana karen- Dr. Kishorilal vyas
2. Raajniti ka batvaara- Harishankar parsai
3. Deep daan – Ramkumar verma

Module- II

(24hrs)

4. Himachadit uttung shikhar aur dhuli hariyali – Vijay kumar sandesh
5. Kaphan chor ka beta – Ushabaala
6. Bahu ki vida- Vinod rastogi

Module- III

(22hr)

7. Jab mai fail hua- Ramkumar Verma
8. Jaan se pyare – Mamta Kaaliya
9. Sati – G.K. Harjeeth

Module- IV

(22hrs)

10. Jab intizar hussain apni janmabhoomi laute – Azhar vajahat
11. Hari ghaas par ghante bhar – Surendra Verma

SEMESTER IV
COMMON COURSE II

MA4A06B18 - മലയാള ഗദ്യരചനകൾ

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

- CO1:** മലയാള ഗദ്യസാഹിത്യത്തിലെ സമകാലിക വിഷയങ്ങൾ ചർച്ച ചെയ്യുക
- CO2:** കേരളീയസംസ്കാര - കലാപരിണാമം , ചരിത്രം, ആത്മകഥ എന്നിവ അപഗ്രഥിക്കുക
- CO3:** ഗദ്യപാഠങ്ങളിലൂടെ സമകാലികവിഷയങ്ങളെ വിലയിരുത്തുക
- CO4:** സമകാലിക സാമൂഹിക വിഷയങ്ങളെ വിമർശനാത്മകമായി നിരൂപണംചെയ്യുക
- CO5:** വിവിധ വിഷയങ്ങളെ ആസ്പദമാക്കി ലേഖനങ്ങൾ തയ്യാറാക്കുക. സ്വാനുഭവങ്ങൾ വിവിധ ആഖ്യാന രൂപങ്ങളിലൂടെ ആവിഷ്കരിക്കുക.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	2	1
CO2	1	2	2	2	1
CO3	2	1	1	2	3
CO4	2	2	2	2	3
CO5	2	1	2	2	2

പാഠഭാഗങ്ങൾ

പുസ്തകങ്ങൾ : ഗദ്യാരാമം , ഓർമ്മകൾ ചന്ദനഗന്ധം പോലെ

ഖണ്ഡം ഒന്ന്

15 മണിക്കൂർ

1. കാളിദാസനും കാലത്തിൻറെ ദാസൻ - ജോസഫ് മുണ്ടശ്ശേരി

2. മോലസന്ദേശവിവർത്തനങ്ങൾ - ഡോ. എൻ .അജയകുമാർ
3. മാതൃഭാഷയിലേക്കു വീണ്ടും - എൻ .വി . കൃഷ്ണവാര്യർ

ഖണ്ഡം രണ്ട്

20 മണിക്കൂർ

1. വാക്കുകളുടെ വിസ്മയം - എം .ടി.വാസുദേവൻനായർ
2. മാറുന്ന മലയാള സംസാരഭാഷ - ടി .ബി .വേണുഗോപാലപ്പണിക്കർ
3. നമ്മുടെ അടുക്കള തിരിച്ചുപിടിക്കുക - സാനാ ജോസഫ്
4. കലയും കലാദർശനവും - ഡോ. ജെ . ഉണ്ണികൃഷ്ണപിള്ള

ഖണ്ഡം മൂന്ന്

15 മണിക്കൂർ

1. ചെമ്പൈ വൈദ്യനാഥ ഭാഗവതർ സംഗീതത്തിലെ സിംഹനാദം - ഇന്ദിരാമേനോൻ
2. ഈശ്വരപിള്ളയെ ആരോർക്കുന്നു - പി. കെ . രാജശേഖരൻ
3. രവിവർമ്മ - വിജയകുമാർ മേനോൻ

ഖണ്ഡം നാല്

15 മണിക്കൂർ

1. പ്രകാശത്തിന്റെ ആയിരം തടവറകൾ - ജീവൻ ജോബ് തോമസ്
2. ജനാധിപത്യ വിദ്യാഭാസം ചില ചിന്തകൾ - ഡോ. കെ .എൻ. പണിക്കർ
3. ഞങ്ങൾ നിങ്ങൾക്ക് ഭൂമി വിറ്റാൽ - സിയാറ്റിൽ മുപ്പൻ

ഖണ്ഡം അഞ്ച്

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മണിക്കൂർ

1. ഓർമ്മകൾ ചന്ദനഗന്ധം പോലെ - ബി. സരസ്വതിയമ്മ

SEMESTER IV

COMPLEMENTARY COURSE I

CH4C01B18: ADVANCED BIO-ORGANIC CHEMISTRY

Credits: 3

Total lecture hours - 54 hrs

Course Outcomes:

CO1: Summarize the classification, isolation and properties of essential oils, alkaloids and lipids.

CO2: Explain the structure, classification and biological functions of Amino acids, proteins, enzymes, nucleic acids, vitamins, steroids and hormones.

CO3: Summarize the preparation, properties and configuration of glucose, fructose, sucrose, starch and cellulose.

CO4: Explain the classification, cleaning action and environmental effects of soaps and detergents.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	1
CO2	2	3	2	2	1
CO3	2	3	2	3	1
CO4	2	3	2	3	1

Syllabus Content:

Module I : Natural Products

(12 Hrs)

Terpenoids: Classification with examples – Isoprene rule – Isolation of essential oils by steam distillation – Uses of lemongrass oil, eucalyptus oil and sandalwood oil - Source, structure and uses of citral and geraniol.

Alkaloids: Classification – Isolation, general properties. Source, structure and physiological activity of nicotine, coniine and piperine.

Lipids: Classification – Oils, fats and waxes (definition, structure, biological functions and examples). Hydrogenation and Rancidity - Acid value, Saponification value and Iodine value –. Biological functions of phospholipids and glycolipids

Soaps and Detergents: Soaps – Types of soaps. Cleansing action of soaps. Synthetic detergents - Classification. Comparison between soaps and detergents. Environmental aspects.

Module II: Amino Acids and Proteins (12 Hrs)

Amino acids: Classification – Zwitter ion formation and isoelectric point- Synthesis of glycine, alanine, and phenyl alanine (any one method). Peptides: Peptide bond. Synthesis of peptides (upto dipeptides). Proteins: Classification of proteins – Primary, secondary and tertiary structure of proteins – Denaturation of proteins – Tests for proteins.

Module III : Enzymes and Nucleic Acids (9 Hrs)

Enzymes: Nomenclature, classification and characteristics. Mechanism of enzyme action. Theory of enzyme catalysis – Michaelis-Menten theory. Cofactors and coenzymes. Enzyme inhibitors. Uses of enzymes.

Nucleic acids: Structure of pentose sugar, nitrogenous base, nucleoside and nucleotide – Double-helical structure of DNA – Differences between DNA and RNA. Biological Functions – Replication and protein biosynthesis. Transcription and Translation. Genetic code.

Energy rich molecules: Elementary structure of ATP, ADP and AMP.

Module IV : Carbohydrates(12 Hrs)

Classification with examples. Preparation and properties of glucose, fructose and sucrose. Cyclic structures and Haworth projections of glucose, fructose, maltose and sucrose (ring size determination not expected). – Mutarotation. Conversion of glucose to fructose and vice versa. – Structure of starch and cellulose (structure elucidation not expected). Industrial applications of cellulose.

Module V: Vitamins, Steroids and Hormones (9 Hrs)

Vitamins: Classification. Structure, biological functions and deficiency diseases of vitamins A, B₁, B₂, B₃, B₅, B₆, B₁₂ (structure not required), C and D.

Steroids: Introduction. Structure and functions of cholesterol. Elementary idea of HDL and LDL. Bile acids.

Hormones: (only examples and biological functions needed. Structures are not needed.)
Introduction. Steroid hormones, peptide hormones and amine hormones (examples, endocrine gland and biological functions, structure not required). Artificial hormones (elementary study only).

SEMESTER IV
COMPLEMENTARY COURSE I

CH4CP01B18: ORGANIC CHEMISTRY PRACTICALS

Credit – 2

Total Hours: 72 Hrs

Course Outcomes:

CO1: Determine the heteroatoms present in an organic compound.

CO2: Identify the functional groups present in an organic compound.

CO3: Summarise the method of preparation of solid derivative of the analysed organic compound.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	2
CO2	2	3	2	2	2
CO3	2	2	2	3	2

Syllabus Content:

1. Tests for elements: Nitrogen, Halogen and Sulphur
2. Determination of physical constants
3. Study of reactions of common functional groups.
4. Qualitative analysis with a view to characterization of functional groups and identification of the following compounds: Naphthalene, anthracene, chlorobenzene, benzyl chloride, p-dichlorobenzene, benzyl alcohol, phenol, o-, m- and p- cresols, α -naphthol, β -naphthol, resorcinol, benzaldehyde, acetophenone, benzophenone: benzoic acid, phthalic acid, cinnamic acid, salicylic acid, ethyl benzoate, methyl salicylate, benzamide, urea, aniline,

o-, m- and p- toluidines, dimethyl aniline, nitrobenzene, o-nitrotoluene, m-dinitrobenzene and glucose. (minimum of ten compounds to be analysed).

5. Organic preparation involving halogenation, nitration, oxidation, reduction, acetylation, benzylation, hydrolysis, diazotization. (non- evaluative)
6. Isolation of an organic compound from a natural source. (non- evaluative)

SEMESTER IV
COMPLEMENTARY COURSE II
ZY4C01B18: APPLIED ZOOLOGY

Credits: 3

Total Lecture Hours: 54

Course Outcomes:

CO1: Develop skills in fish breeding techniques and various aquaculture practices.

CO2: Analyse the life history and rearing techniques of silkworm.

CO3: Practice earthworm rearing techniques and methods of vermicomposting.

CO4: Illustrate social life in honey bees and management of an apiary in relation with entrepreneurship development.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	2	2
CO2	2	3	2	1	2
CO3	2	3	2	2	1
CO4	1	3	1	2	3

Syllabus Content:-

Module I: Aquaculture

24 Hrs

Advantages of aquaculture, Traditional methods of aquaculture, Biotic and abiotic factors in water, Pond culture – construction and maintenance. Types of aquaculture, composite fish culture, integrated fish culture, induced breeding of carp & prawn, Importance of algae in aquaculture. Aquarium management - Setting up of an aquarium, biological filter and aeration. Common cultivable fishes of Kerala. Fish diseases, Prawn culture, mussel culture, pearl culture, Fish processing and preservation.

Module II: Sericulture

12 Hrs

Four species of silkworms, life history of silkworm, silk worm rearing techniques, Mounting of silkworm - Chandrika, defective cocoons, harvesting and stifling of cocoons. Silkworm diseases and pest, preventive and control measures.

Module III: Vermiculture

6 Hrs

Species of earthworms, ecological classification of earthworms, life cycle and reproduction of earthworm. Physical & chemical effects of earthworms on soil, Vermicomposting – site selection, preparation of pit, maintenance, monitoring and harvesting of vermicompost.

Module IV: Apiculture

12 Hrs

Species of honey bees, organization of honey bee colony. Bee keeping methods and equipments. Apiary management and maintenance. Bee pasturage, byproducts of honey bees and their uses. Diseases, pests of honey bees and control measures.

SEMESTER IV

COMPLEMENTARY COURSE II

ZY4CP01B18: PHYSIOLOGY, IMMUNOLOGY AND APPLIED ZOOLOGY

Credits – 2

Total Hours: 72

Course Outcomes:

CO1: Analyse the presence of reducing sugar, protein and lipid.

CO2: Identify human blood groups and leucocytes and estimate haemoglobin.

CO3: Explain the action of salivary amylase, principle and use of sphygmomanometer and stethoscope.

CO4: Compare economic importance and morphology of culturable fishes, earthworms, honey bees and silkworm.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	2
CO2	2	3	2	2	2
CO3	2	3	2	1	2
CO4	2	3	2	3	2

PHYSIOLOGY AND IMMUNOLOGY

1. Preparation of Human Blood smear & Identification of leucocytes.
2. Qualitative analysis of Reducing Sugar, Protein and Lipid.
3. Action of Salivary amylase on Starch (Demonstration Only).
4. Estimation of Haemoglobin (Demonstration only).
5. Identification of human blood groups, A, AB, B and O, Rh factor.
6. Instruments (Principle & uses) -Sphygmomanometer, Stethoscope.

APPLIED ZOOLOGY

General identification, economic importance, morphology, scientific names and common names of the following

1. Economic importance and morphology of culturable fishes (Catla, Rohu, Grass carp, Common carp, Silver carp, Etroplus, Tilapia)
2. Two species of earthworms used in Vermiculture
3. Two species of honey bees
4. Silkworm. Cocoon/Adult
5. Castes of honey bees
6. Bee keeping equipments - Bee hive, Smoker, honey extractor
7. Identification and uses - Bee wax, Honey, Silk, Vermicompost
8. Chandrika / Natrika used in sericulture

SEMESTER IV

CORE COURSE

BO4B04B18: PTERIDOLOGY, GYMNOSPERMS AND PALEOBOTANY

Credits: 3

Total Lecture hours: 54

Course Outcomes:

CO1: Identify the different types of pteridophytes and gymnosperms based on the characteristics and general features.

CO2: Explain the salient features of pteridophytes and gymnosperms based on their basic characters such as habitat, reproduction, life cycle etc.

CO3: Analyze the significance of algae and bryophytes.

CO4: Compare the morphology, anatomy, reproduction and life cycle of different types of pteridophytes and gymnosperms.

Mapping of Course Outcomes with Programme Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	1
CO2	2	2	2	3	2
CO3	3	2	1	2	2
CO4	3	1	2	2	2

Syllabus Content: -

PTERIDOLOGY

Module 1: General Introduction and Classification of Pteridophytes and Type Study (23 hrs)

Introduction, general characters and classification of Pteridophytes up to classes by Smith (1955) and a very brief account of the classification by Christenhusz *et al.*, 2011.

Type study- Study the distribution, morphology, anatomy, reproduction, life cycle and affinities of the following types (Developmental details are not required): Psilophyta - *Psilotum*; Lycophyta - *Lycopodium*, *Selaginella*; Sphenophyta - *Equisetum*; Pterophyta - *Pteris*, *Marsilea*. Stellar evolution in Pteridophytes; Heterospory and seed habit.

Module 2: Economic and Ecological Importance (4 hrs)

Importance of Pteridophytes: medicinal, ornamental, as biofertilizer.

GYMNOSPERMS

Module 3: General Introduction, Classification of Gymnosperms and Type Study (16 hrs)

Introduction, General characters, classification of Gymnosperms by Sporne (1965) and a very brief account of the classification by Christenhusz *et al* (2011). Affinities of Gymnosperms with Pteridophytes and Angiosperms.

Type study: Distribution, morphology, anatomy, reproduction, life cycle and affinities of the following types (Developmental details are not required): Cycadopsida – *Cycas*; Coniferopsida – *Pinus*; Gnetopsida– *Gnetum*.

Module 4: Economic and Ecological Importance of Gymnosperms (2 hrs)

Uses of Gymnosperms: as food, medicine, in industry and as ornamental plants.

SEMESTER IV

CORE COURSE

**BO4BP02B18 - PHYCOLOGY AND BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS
AND PALEOBOTANY**

Credits –2

Total Hours: 72 hrs

Course Outcomes:

CO1: Identify the different algal specimens and their vegetative and reproductive structures of each type.

CO2: Analyze the anatomy of thallus and reproductive structures of Riccia, Marchantia, Anthoceros and Funaria.

CO3 : Analyze the habit, TS of stem, morphology of the strobilus of the following types: Psilotum, Lycopodium, Selaginella, Equisetum, Pteris, Marsilea.

CO4: Analyze the habit, TS of leaf and stem, TLS and RLS of coniferous wood (Pinus), morphology of reproductive structures of Cycas, Pinus and Gnetum.

Mapping of Course Outcomes with Programme Specific Outcomes:

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	2	2
CO2	3	2	3	2	2
CO3	3	2	3	2	2
CO4	3	2	2	2	2

Syllabus Content: -

PHYCOLOGY

1. Make micropreparations of vegetative and reproductive structures of the types mentioned in the syllabus.

-
2. Algal Culture: isolation and cultivation of micro- and macro-algae in suitable growth media.
 3. Familiarizing the technique of algal collection and preservation.

BRYOLOGY

1. Studying the habit, anatomy of thallus and reproductive structures of Riccia, Marchantia, Anthoceros and Funaria.

PTERIDOLOGY:

1. Study of the habit, TS of stem, morphology of the strobilus of the following types: Psilotum, Lycopodium, Selaginella, Equisetum, Pteris, Marsilea.

GYMNOSPERM:

1. Study of the habit, TS of leaf and stem, TLS and RLS of coniferous wood (Pinus), morphology of reproductive structures of Cycas, Pinus and Gnetum.