

---

**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**

### **PROGRAM 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**

<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>	<b>Course Type</b>
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	Kathasahityam		
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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	1	1	1	2
<b>CO2</b>	1	1	1	1	3
<b>CO3</b>	1	1	1	1	2
<b>CO4</b>	1	1	1	1	3
<b>CO5</b>	1	1	1	1	2

## **Syllabus Content**

### **Module I (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 II (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 III (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 IV (18 Hours)**

#### **Tense and Related Topics**

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

#### **Interrogatives and Negatives**

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

### **Module V (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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	1	1	2	2
<b>CO2</b>	1	1	1	1	1
<b>CO3</b>	1	1	1	3	1
<b>CO4</b>	1	1	1	2	3

**Syllabus Content:**

**Module I (Fiction) (18hours)**

Ernest Hemingway: The Old Man and the Sea

**Module II (One Act Plays) (18hours)**

Susan Glaspell: Trifles

Asif Currimbhoy: The Refugee

A.A Milne: The Boy Comes Home

**Module III (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 IV (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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	1	1	3	2
<b>CO2</b>	1	1	1	1	3
<b>CO3</b>	1	1	1	1	2
<b>CO4</b>	1	1	1	1	3
<b>CO5</b>	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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	1	1	2	2
<b>CO2</b>	1	1	1	1	1
<b>CO3</b>	1	1	1	1	1
<b>CO4</b>	1	1	1	1	1
<b>CO5</b>	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 നോവലിന്റെയുംകാലാനുസൃതമായ 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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	1	1	1	2
<b>CO2</b>	1	1	1	1	1
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	2	2	1	2	3
<b>CO5</b>	1	1	1	1	1
<b>CO6</b>	1	1	1	1	2

**Syllabus Content:**

<b>ഖണ്ഡംഒന്ന്</b>	<b>10മണിക്കൂർ</b>
1.പുവമ്പഴം -കാരുർ	
2.ഭൂമിയുടെഅവകാശികൾ - വൈക്കംമുഹമ്മദ്ബഷീർ	
<b>ഖണ്ഡംരണ്ട് -</b>	<b>15മണിക്കൂർ</b>
1.കടൽ -ടി .പദ്മനാഭൻ	
2.പെരുമഴയുടെപിറ്റേന്ന് -എം. ടി. വാസുദേവൻനായർ	
3.മാനാഞ്ചിറടെസ്സ് -വി .കെ.എൻ	
4.തരിശുനിലം -മാധവിക്കുട്ടി	
<b>ഖണ്ഡംമൂന്ന് -</b>	<b>15മണിക്കൂർ</b>
1.ആർക്കനിയം -സക്കറിയ	
2.ഓരോഎഴുത്തുകാരിയുടെഉള്ളിലും -സാറാജോസഫ്	
3.തിരുത്ത് -എൻ .എസ് .മാധവൻ	
4.മോഹമത്തെ -കെ .ആർ .മീര	
<b>ഖണ്ഡംനാല് -</b>	<b>10 മണിക്കൂർ</b>
1.അഗ്നി -സിതാര.എസ്	
2.ബിരിയാണി -സന്തോഷ്എച്ചിക്കാനം	
3.മോദസ്ഥിരനായി അങ്ങ് വസിപ്പുമലപോലെ -എസ്. ഹരീഷ്	
4.സ്നേഹബഹുമാനപ്പെട്ടഅന്നാമ്മയ്ക്ക്ഗീതാലക്ഷ്മിഎഴുതുന്നകത്ത് - പ്രിയഎ .എസ്	
5.ചിലസ്വപ്നങ്ങളിൽ .....സീതാലക്ഷ്മിയുടെകുറുത്തമുടിയിഴ - ഇന്ദുമേനോൻ	
<b>ഖണ്ഡംഅഞ്ച് -</b>	<b>22മണിക്കൂർ</b>
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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	1	2	2	1	1
<b>CO2</b>	1	2	2	1	1
<b>CO3</b>	1	1	1	3	1
<b>CO4</b>	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 1V: 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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	1	1	1
<b>CO2</b>	3	1	1	1	1
<b>CO3</b>	1	1	1	3	1
<b>CO4</b>	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: Scutigereilla)
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 Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	2	1	2	1	2
<b>CO2</b>	3	2	2	1	1
<b>CO3</b>	2	1	1	1	1
<b>CO4</b>	2	1	2	1	3

**Syllabus Content:**

**Module I: 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 II: 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 III: 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 IV: 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 V: 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.