

# 1 DEMOCRACY ELECTION AND GOOD GOVERNANCE



**GONDWANA UNIVERSITY, GADCHIROLI.**

**Ordinance No. 58 of 2017**

**Incorporating a Compulsory Course on Environmental Studies in the Under Graduate Courses offered under all the Faculties, ordinance, 2017.**

Syllabus

## **Democracy, Elections and Good Governance**

### **• Democracy in India**

- Dimensions of Democracy: Social. Economic and political
- Decentralization: Grassroots Level Democracy
- Challenges before Democracy: women and marginalized sections of the society

### **• Election to Local Self Government Bodies**

- 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission
- Local Body Elections: Urban & Rural
- Duties of an individual

### **• Good Governance**

- Meaning and concept
- Government and Governance
- Good Governance initiatives in India

# 2 BA SEM IV COMP. ENGLISH

GONDWANA UNIVERSITY, GADCHIROLI

S. Y. B. A. Sem- IV- CBCS

COMPULSORY ENGLISH

For the session 2019-20 and onwards

| Content  | Marks Allotted   |
|--|--|
| <b>Unit I: Prose</b>                             | <b>(20)</b>  |
| 1. <u>Water: The Elixir of Life</u>              | C. V. Raman (environment)                              |
| 2. Education: Indian and American                | Anurag Mathur  |
| 3. <u>Muhammad Yunus: An Economics for Peace</u> | Farida Khan (professional ethics, human value, gender) |
| <b>Unit II: Poetry</b>                           | <b>(20)</b>  |
| 1. She Walks in Beauty                           | Lord Byron   |
| 2. Bangle Sellers                                | Sarojini Naidu   |
| 3. Hunger  | Jayanta Mahapatra                                      |
| <b>Unit III: Grammar</b>                         | <b>(10)</b>  |
| 1. Subject-verb Agreement                        |  |
| 2. Changing Voice                                |  |
| <b>Unit IV: Communication and Writing Skills</b> | <b>(30)</b>  |
| 1. Making Requests and Responding to Requests    |  |
| 2. Giving Personal Information                   |  |
| 3. News Reports                                  |  |
| 4. Writing Advertisements                        |  |

Gondwana University  
**B.Com. Part I (Semester - II)**

Core Course - CBCS

**PRINCIPLES OF MANAGEMENT - I (UCA1CO5)**

Total Marks : 60

1. To acquaint the Students with the basic concept, Principles and functions of Management.
2. To make students aware about the recent trends in management.

**Unit-I : Direction and Communication**

Direction- Meaning, Principles, Techniques, Process of Communication of as Management Functions, Barriers to Communication, Essentials of Organizational Communication.  
- 15 Periods

**Unit-II : Motivation and Leadership –**

Motivation- Meaning, importance, Theories of motivation- (Maslow's need Hierarchy Theory, -Herzberg's Theory, Douglas, McGregor's Theory, 'x' and Theory 'y', McClelland's Theory) Leadership – Meaning and Importance, Qualities, Functions of leader, Leadership styles.  
- 15 Periods

**Unit-III : Co-ordination and Control –** Co-ordination – Meaning, Need, Requisites for excellent Co-ordination Techniques of Co-ordination. Control – Need, Steps in the process of Control Techniques. - 15 Periods

**Unit-IV: New Trends in Management :**

1. **Business Ethics and Social Responsibility.**
2. Disaster Management.
3. Management of Change.
4. Event Management.

*(Professional Ethics)*

- 15 Periods

## 4. BSC & BCOM SEM I COMP. ENGLISH

(To be implemented from June 2017)

80 Marks Theory (University Examination) + 20 Marks Internal Assessment

F. Y. B. Com. / B. Sc./B. Sc. (I.T.)/B. C. A. (Sci.)

### Semester I- Compulsory English

#### Core Course

Course Code- UCA1C02

#### Prose Section

|   |   |
|---|---|
| 1 | The Homecoming – Rabindranath Tagore                          |
| 2 | Playing the English Gentleman – M. K. Gandhi                  |
| 3 | Prospects of Democracy in India- Dr. B. R. Ambedkar           |
| 4 | <u>Indira Nooyi : A Corporate Giant</u> (PROFESSIONAL ETHICS) |

#### Poetry Section

|   |  |
|---|--|
| 1 | The Village School Master – Oliver Goldsmith |
| 2 | <u>If- Rudyard Kipling</u> (HUMAN VALUE)     |
| 3 | My Grandmother's House – Kamala Das          |

#### Grammar and Communication Skills

|   |
|---|
| Articles  |
| Prepositions  |
| Tenses  |
| Synonyms and Antonyms   |
| Correction of Sentences   |
| Paragraph Writing   |
| Introduction to Soft Skills- Leadership Skills, Team Work Skills, Time Management, Goal Setting |
|   |

## 5 BSC & BCOM SEM II COMP. ENGLISH

F. Y. B. Com. / B. Sc./B. Sc. (I.T.)/B. C. A. (Sci.)

### Semester II

### Compulsory English

### Core Course

Course Code- UCA2C02

#### Prose Section

|   |  |                              |
|---|--|------------------------------|
| 1 | The Three Questions – Leo Tolstoy        |                              |
| 2 | The Chicago Speech – Swami Vivekananda ✓ | (HUMAN VALUE)                |
| 3 | Work Brings Solace – APJ Abdul Kalam ✓   | (HUMAN VALUE & PROF. ETHICS) |
| 4 | Why Is the Sea Blue? – G. Venkataraman   |                              |

#### Poetry Section

|   |  |               |
|---|--|---------------|
| 1 | Where the Mind is Without Fear – Rabindranath Tagore ✓ | (HUMAN VALUE) |
| 2 | Money-Madness – D. H. Lawrence ✓                       | (HUMAN VALUE) |
| 3 | Leisure – W. H. Davies                                 |               |

#### Grammar and Communication Skills

|                             |
|-----------------------------|
| Question Tag                |
| Voice                       |
| Advertisements              |
| Dialogue Writing            |
| Giving Personal information |
| Describing Daily Routine    |
| Notices, Agenda & Minutes   |

## 6 BA SEM I COMP. ENGLISH

### GONDWANA UNIVERSITY, GADCHIROLI SYLLABUS OF COMPULSORY ENGLISH

To be implemented from 2017-18

#### *Semester I*

**Unit I : Prose**

- |                                     |                    |
|-------------------------------------|--------------------|
| 1. Strong Roots                     | Dr.APJ Abdul Kalam |
| 2. Maintaining Democracy            | Dr.B.R.Ambedkar    |
| 3.Black Money and the Black Economy | C.Rammanohar Reddy |

**Unit II : Poetry**

- |  |                      |               |
|--|----------------------|---------------|
| 1. <u>Where the Mind is without Fear</u>       | Rabindranath Tagore  | (human value) |
| 2. <u>Stopping by Woods on a Snowy Evening</u> | Robert Frost         | (human value) |
| 3. Seven Ages of Man                           | Williams Shakespeare |               |

**Unit III : Grammar**

- A. Articles
- B. Prepositions
- C. Tenses-(Present Continuous, Past Continuous, Past Perfect)

**Unit IV : Communication Skills**

- A. Congratulating and Responding to Congratulations
- B. Asking for, Giving and Refusing Permission
- C. Job application.
- D. Curriculum Vitae (CV).

#### *Semester II*

**Unit I : Prose**

- |                                      |                   |
|--------------------------------------|-------------------|
| 1.India's Message to the World       | Swami Vivekanda   |
| 2. Eyes are not here                 | Ruskin Bond       |
| 3.The Birth of India's film Industry | Pamela Hutchinson |

**Poetry**

- |                            |                 |
|----------------------------|-----------------|
| 1. My Grand Mother's House | Kamala Das      |
| 2. Ozymindias              | P.B.Shelley     |
| 3. To Science              | Edgar Allan Poe |

**Unit III : Grammar**

- A.Synonyms
- B.Antonyms
- C.Tenses
  - i) Simple Present Tense
  - ii) Present Perfect Tense
  - iii) Simple Past Tense

**Unit IV : Communication Skills**

- A.Meeting people, Exchanging Greetings / Salutations & Taking Leave
- B.Introducing Yourself
- C. Preparing a Paragraph with the help of given points.
- D.. Formal letter.

Textbook prescribed for Sem. I & Sem. II-

Roots- Orient BlackSwan.

## 7. BA SEM III COMP. ENGLISH

GONDWANA UNIVERSITY, GADCHIROLI

**S. Y. B. A. Sem- III- CBCS**

**COMPULSORY ENGLISH**

For the session 2019-20 and onwards

|                    | Content  | Marks Allotted                                |
|--------------------|--|---|
| <b>Unit- I :</b>   | <b>Prose-</b>                                  | <b>(20)</b>                                   |
|                    | 1. Speech on Indian Independence               | Jawaharlal Nehru                              |
|                    | 2. The Human Environment                       | Indira Gandhi                                 |
|                    | 3. TV as Babysitter                            | Jerzy Kosinski                                |
| <b>Unit- II :</b>  | <b>Poetry-</b>                                 | <b>(20)</b>                                   |
|                    | 1. Sonnet 29                                   | William Shakespeare                           |
|                    | 2. <u>Ecology</u>                              | A. K. Ramanujan (Environment and human value) |
|                    | 3. <u>An Old Woman</u>                         | Arun Kolatkar ● (Human Value)                 |
| <b>Unit- III :</b> | <b>Grammar-</b>                                | <b>(10)</b>                                   |
|                    | A. One word Substitution                       |   |
|                    | B. Question Tags                               |   |
|                    | C. Formation of Noun, Adjective, Verb, Adverb  |   |
| <b>Unit- IV :</b>  | <b>Communication / Writing Skills-</b>         | <b>(30)</b>                                   |
|                    | A. Asking for Directions and Giving Directions |   |
|                    | B. Thanking Someone and Responding to Thanks   |   |
|                    | C. Comprehension                               |   |
|                    | D. Understanding Advertisements                |   |

**Gondwana University Gadachiroli**  
**Semester I**  
**B.A. First year (Sociology)**  
**CORE PAPERS**  
**Introduction to Sociology**  
**Semester – I**

**☒ Unit – I - Understanding Sociology.**

- . The origin and development of Sociology.
- . Definition of Sociology
- . Sociology as a Science
- . Nature & Scope of Sociology
- . Subject matter of Sociology
- . Sociology & its relationship with political Science and Economics
- . Importance of Sociology

**☒ Unit – II - Basic Concepts**

- . Society – Meaning and characteristics
- . Social Group – meaning & Characteristics of Social group
- . Types of Social group – Primary group, Secondary group
- . Characteristics & Importance of Primary & Secondary group
- . Merton’s theory of Reference group
- . Social Structure – Meaning and elements of Social Structure
- . Social Status – Meaning and types.

**☒ Unit – III - Institutions**

- . Meaning and Characteristics
- . Family – Definition, characteristics, types, recent Changes in the Functions of Family
- . Marriage – Meaning, Aims of marriage, Characteristics, types of marriage, Changing nature of marriage.
- . Religion – Meaning & basic Characteristics, Functions of religion.

**☒ Unit – IV – Culture and Socialization**

**(HUMAN VALUE)**

- . Definition
- . Types of Culture
- . Characteristics of culture
- . Elements of Culture
- . Socialization - meaning of Socialization –Aims of Socialization
- . Stages of Socialization
- . Agencies of Socialization
- . Importance of Socialization



## 9 ENVIRONMENT STUDIES

10. The concerned Faculty can adopt this mandatory course as per the suggested guidelines without or with minor modifications that are deemed to be desirable considering the curricular structure of the given under-graduate course.
11. The syllabus, relevant guidelines regarding the scheme of examination and fees structure are appended with this ordinance as Annexure-A, Annexure-B and Annexure-C respectively.

### Annexure– A: Syllabus

**Course Code:** ES (Compulsory Course)

**Title of the Course:** Environmental Studies

| Unit | Contents  | Hrs. |
|------|---|------|
| I    | <b>The Multidisciplinary nature of environment</b><br>. Definition, scope and importance.<br>. Need for public awareness – Institutions in environment, people in environment   | 01   |
| II   | <b>Social Issues and the Environment</b><br>. From Unsustainable to Sustainable development, Urban problems related to energy; Water conservation, rain water harvesting, watershed management<br>. Resettlement and rehabilitation of people; its problems and concerns. Case studies.<br>. Environmental ethics: Issues and possible solutions, resource consumption pattern and need for equitable utilisation, Urban and rural equity issues, need for gender equity<br>. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.<br>. Wasteland reclamation - Consumerism and waste products.<br>. Environment Protection Act.<br>. Air (Prevention and Control of Pollution) Act.<br>. Water (Prevention and Control of Pollution) Act.<br>. Wildlife Protection Act.<br>. Forest Conservation Act.<br>. Issues involved in enforcement of environmental legislation.<br>. Public awareness- environmental calendar of activities, self initiation   | 04   |
| III  | <b>Human Population and the Environment</b><br>. Global population growth, variation among nations, Population explosion - Family Welfare Programmes, methods of sterilization; Urbanization<br>. Environment and human health – climate and health, infectious diseases, water-related diseases, risk due to chemicals in food, cancer and environment<br>. Human Rights – equity, nutrition and health rights, IPRs, community biodiversity registers (CBRs)<br>. Value Education – environmental values, valuing nature, cultures, social justice, human heritage, equitable use of resources, common property resources, ecological degradation<br>. HIV / AIDS; Women and Child Welfare.<br>. Role of Information Technology in Environment and human health.<br>. Case Studies.   | 03   |
| IV   | <b>Natural resources: Renewable and non-renewable resources</b><br>. Natural resources and associated problems.<br>- Forest resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.<br>- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.<br>- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.<br>- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies.<br>- Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.<br>- Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.<br>. Role of an individual in conservation of natural resources.<br>. Equitable use of resources for sustainable lifestyles | 04   |
| V    | <b>Ecosystems</b><br>. Concept of an ecosystem- ecosystem degradation, resource utilisation<br>. Structure and function of an ecosystem - Producers, consumers and decomposers.<br>. Energy flow in the ecosystem – water, carbon, oxygen, nitrogen and energy cycles, integration of cycles in nature<br>. Ecological succession - Food chains, food webs and ecological pyramids.<br>. Ecosystemtypes, characteristic features, structure and functions of the following ecosystem-<br>- Forest ecosystem   | 03   |

|              |  |    |
|--------------|--|----|
|              | <ul style="list-style-type: none"> <li>- Grassland ecosystem</li> <li>- Desert ecosystem</li> <li>- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)</li> </ul>   |    |
| VI           | <p><b>Biodiversity and its conservation</b></p> <ul style="list-style-type: none"> <li>. Introduction - Definition: genetic, species and ecosystem diversity.</li> <li>. Bio-geographical classification of India.</li> <li>. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and optional values.</li> <li>. Biodiversity at global, National and local levels.</li> <li>. India as a mega-diversity nation; Hot-spots of biodiversity.</li> <li>Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.</li> <li>. Endangered and endemic plant and animal species of India.</li> <li>. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</li> </ul> | 04 |
| VII          | <p><b>Environmental Pollution</b></p> <ul style="list-style-type: none"> <li>. Definition</li> <li>. Causes, effects and control measures of:- <ul style="list-style-type: none"> <li>- Air pollution</li> <li>- Water pollution</li> <li>- Soil pollution</li> <li>- Marine pollution</li> <li>- Noise pollution</li> <li>- Thermal pollution</li> <li>- Nuclear hazards</li> </ul> </li> <li>. Solid Waste Management: Causes, effects and control measures of urban and industrial waste.</li> <li>. Role of an individual and institutions in prevention of pollution.</li> <li>. Disaster management: floods, earthquake, cyclone and landslides.</li> <li>. Pollution case studies.</li> </ul>   | 04 |
| VIII         | <p><b>Field work</b></p> <ul style="list-style-type: none"> <li>. Visit to a local area to document environmental assets like river / forest / grass land / hill / mountaintec</li> <li>. Visit to a local polluted site - Urban / Rural / Industrial / Agriculturaletc</li> <li>. Study of common plants, insects, birds.</li> <li>. Study of simple ecosystems - pond, river, hill slopes, etc.</li> </ul>   | 02 |
| <b>Total</b> |  | 25 |

## Annexure– B: Scheme of Examination

| Course Scheme |             |           |              |         | Examination Scheme |    |       |
|---------------|-------------|-----------|--------------|---------|--------------------|----|-------|
| Lectures      | Tutorial(s) | Practical | Periods/week | Credits | MSE                | IE | Total |
| 2             | 0           | 0         | 2            | 0       | 75                 | 25 | 100   |

1. Contents of the syllabi as per Appendix A mentioned under unit I to VII shall be for teaching and for the examination to be conducted at the end of the semester i.e. MSE for 75 marks. The examination paper shall be having MCQs, Short answer type questions and an Essay. The IE consisting of 25 marks will be in the form of Report to be submitted based on field work done as per Unit No VIII.
  
2. The result would be declared in the form of Grades as shown below:  
Grade ‘O’ for score above 75; A:61-75; B:51-60; C:40-50

# 10 BA SEM IV COMP. ENGLISH

GONDWANA UNIVERSITY, GADCHIROLI

S. Y. B. A. Sem- IV- CBCS

COMPULSORY ENGLISH

For the session 2019-20 and onwards

| Content  | Marks Allotted   |
|--|--|
| <b>Unit I: Prose</b>                             | <b>(20)</b>  |
| 1. <u>Water: The Elixir of Life</u>              | C. V. Raman (environment)                              |
| 2. Education: Indian and American                | Anurag Mathur  |
| 3. <u>Muhammad Yunus: An Economics for Peace</u> | Farida Khan (professional ethics, human value, gender) |
| <b>Unit II: Poetry</b>                           | <b>(20)</b>  |
| 1. She Walks in Beauty                           | Lord Byron   |
| 2. Bangle Sellers                                | Sarojini Naidu   |
| 3. Hunger  | Jayanta Mahapatra                                      |
| <b>Unit III: Grammar</b>                         | <b>(10)</b>  |
| 1. Subject-verb Agreement                        |  |
| 2. Changing Voice                                |  |
| <b>Unit IV: Communication and Writing Skills</b> | <b>(30)</b>  |
| 1. Making Requests and Responding to Requests    |  |
| 2. Giving Personal Information                   |  |
| 3. News Reports                                  |  |
| 4. Writing Advertisements                        |  |

# 11 BA SEM III COMP. ENGLISH

GONDWANA UNIVERSITY, GADCHIROLI

**S. Y. B. A. Sem- III- CBCS**

**COMPULSORY ENGLISH**

For the session 2019-20 and onwards

|                    | Content  | Marks Allotted                                |
|--------------------|--|---|
| <b>Unit- I :</b>   | <b>Prose-</b>                                  | <b>(20)</b>                                   |
|                    | 1. Speech on Indian Independence               | Jawaharlal Nehru                              |
|                    | 2. The Human Environment                       | Indira Gandhi                                 |
|                    | 3. TV as Babysitter                            | Jerzy Kosinski                                |
| <b>Unit- II :</b>  | <b>Poetry-</b>                                 | <b>(20)</b>                                   |
|                    | 1. Sonnet 29                                   | William Shakespeare                           |
|                    | 2. <u>Ecology</u>                              | A. K. Ramanujan (Environment and human value) |
|                    | 3. <u>An Old Woman</u>                         | Arun Kolatkar ● (Human Value)                 |
| <b>Unit- III :</b> | <b>Grammar-</b>                                | <b>(10)</b>                                   |
|                    | A. One word Substitution                       |   |
|                    | B. Question Tags                               |   |
|                    | C. Formation of Noun, Adjective, Verb, Adverb  |   |
| <b>Unit- IV :</b>  | <b>Communication / Writing Skills-</b>         | <b>(30)</b>                                   |
|                    | A. Asking for Directions and Giving Directions |   |
|                    | B. Thanking Someone and Responding to Thanks   |   |
|                    | C. Comprehension                               |   |
|                    | D. Understanding Advertisements                |   |

GONDWANA UNIVERSITY, GADCHIROLI  
C.B.C.S. SYLLABUS  
PROGRAMME- BACHELOR OF SCIENCE (B.Sc.), SEMESTER-I  
SUBJECT- ZOOLOGY, THEORY (CREDITS 2)  
CORE PAPER I  
USZOT01

**ENVIRONMENT AND  
SUSTAINABILITY**

**Paper I - ANIMAL DIVERSITY OF NON-CHORDATE  
(PROTOZOA TO ANNELIDA)**

**Unit 1: Phylum -Protozoa**

**(12 Periods)**

General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa. Nutrition and Reproduction in *Paramecium*.

**Phylum-Porifera**

General characters and classification up to classes; Structure, Histology of body wall and Canal System in *Sycon*

**Unit 2: Phylum-Cnidaria**

**(12 Periods)**

General characters and classification up to classes; Structure and life cycle of *Obelia*, Polymorphism in Hydrozoa, Alternation of generation, Locomotion and Nutrition in *Hydra*, Nematocyst, Coral reef.

**Unit 3: Phylum-Platyhelminthes**

**(12 Periods)**

General characters and classification up to classes; Structure and Life history of *Taenia solium*

**Phylum-Nemathelminthes**

General characters and classification up to classes; Structure and Life history of *Ascaris lumbricoides* and its parasitic adaptations.

**Unit 4: Phylum-Annelida**

**(12 Periods)**

General characters and classification up to classes; *Hirudinaria*: External morphology, Digestive, excretory, Nervous system, Reproductive system, Copulation, Fertilization and Cocoon formation

GONDWANA UNIVERSITY, GADCHIROLI  
C.B.C.S. SYLLABUS  
PROGRAMME- BACHELOR OF SCIENCE (B.Sc.), SEMESTER-II  
SUBJECT- ZOOLOGY,THEORY (CREDITS 2)  
CORE PAPERIII  
USZOT03

ENVIRONMENT AND  
SUSTAINABILITY

Paper I - ANIMAL DIVERSITY OF NON-CHORDATE  
(ARTHROPODA TO HEMICHORDATA)

**Unit 1: Phylum-Arthropoda**

(12 Periods)

General characters and classification up to classes

**Periplaneta** - External Morphology, Digestive system, Circulatory system, Nervous system, Reproductive system and Sense organs.

**Unit 2: Phylum-Mollusca**

(12 Periods)

General characters and classification up to classes

**Pila**- External Morphology, Digestive system, Nervous system, Reproductive system, Copulation and Fertilization.  
Pearl formation.

**Unit 3: Phylum-Echinodermata**

(12 Periods)

General characters and classification up to classes

**Asterias** -External Morphology, Endoskeleton, Digestive system, Water vascular system, Bipinnaria and Brachiolaria larva.

Regeneration and Autotomy in Echinoderm.

**Unit 4: Phylum Hemichordata**

(12 Periods)

General characters and classification up to classes

**Balanoglossus** -External Morphology, Coelom, Digestive system, Nervous system, Sense organs, Reproductive system, Tornaria larva

Affinities of Balanoglossus.

GONDWANA UNIVERSITY, GADCHIROLI  
CHOICE BASED CREDIT SYSTEM (CBCS) SYLLABUS  
PROGRAMME- BACHELOR OF SCIENCE (B.Sc.), SEMESTER-III  
SUBJECT- ZOOLOGY, THEORY (CREDITS 2)

CORE PAPER V

USCZOT05

**Paper I - ANIMAL DIVERSITY (CHORDATES) AND COMPARATIVE ANATOMY**

- Unit- I** (12 periods)
1. Urochordata- General characters, Ascidian tadpole and retrogressive metamorphosis
  2. Cephalochordata- General characters, Amphioxus - External morphology and digestive system.
  3. Cyclostomata- General characters, external morphology of Petromyzon and Myxine.
  4. Pisces- General characters and Classification up to order; Osmoregulation in Fishes, Accessory respiratory organs.

- Unit-II** (12 periods)
1. Amphibia- General characters and Classification up to order, Parental care and Neoteny.
  2. Reptilia- General characters and Classification based on temporal vacuities. Snake venom, Poison apparatus & biting mechanism, Poisonous and non poisonous snake

- Unit-III** (12 periods)
1. Aves – General characters and classification up to order. Flight adaptations (Morphological, Anatomical and Physiological), Birds migration and its significance
  2. Mammals – General characters and classification up to order. Prototheria, Metatheria and Eutheria.

- Unit-IV : Comparative anatomy** (12 periods)
1. Comparative account of derivatives of integuments (Scale and horn).
  2. Comparative account of aortic arches and heart.
  3. Types of receptors (General cutaneous receptors and chemoreceptor).
  4. Comparative account of Urinogenital system.

B. Sc. Botany Syllabus covering topics related to Environment education and awareness.

**SEMESTER – IV**

**Paper – II**

**Plant Ecology**

**(48 Periods)**

**UNIT – I: (12 Periods)**

1. **Ecology:** Plant and Environment, branches of ecology and significance.
2. **Climatic Factors:** Atmosphere, Light, Temperature.
3. **Edaphic Factors:** Pedogenesis (process), Soil profile and properties (Physical and Chemical).
4. **Biotic Factors:** Interactions between plants and animals, interaction between plants growing in a community, interactions between plants and soil microorganisms.

**UNIT – II: (12 Periods)**

1. **Ecosystem:** Structure, Biotic and Abiotic components, Food chains, Food web, Ecological pyramid.
2. **Biogeochemical Cycles:** Water, Carbon, Nitrogen.
3. **Environmental Pollution:** Air, Water and its control.

**UNIT – III: (12 Periods)**

1. **Autecology:** Definition, parameters and importance, growth curve, interaction among population, ecad, ecotype- characteristics and importance.
2. **Synecology:** Life forms, Community dynamics, study of community (analytical and synthetic characters).

**UNIT – IV: (12 Periods)**

1. **Plant Succession:** Definition, causes of succession, Climax concept; Hydrosere, Xerosere.
2. **Phytogeography:** Botanical zones or Phytogeographic regions of India (Name, distribution area, typical vegetation). Concept of continental drift
3. Phytogeographical studies of Chandrapur and Gadchiroli districts.
4. Western Himalaya, Eastern Himalaya, Indus plane, Gangatic plane, Central India, Western coast, Deccan, Assam.



M. Sc. Botany Syllabus  
**Semester IV**  
Course code- PSCBOTT14  
PAPER –XIV: Angiosperms - II

**UNIT- I:**

General account, distinguished characters, floral variation and evolution, affinities of :- Magnoliidae, Hamamelidae, Dilleniidae, Rosidae, Asteridae, circumscription as per Cronquist, 1968

**UNIT- II:**

General account, distinguished characters, floral variation and evolution, affinities of :- Alismatidae, Commelinidae, Aracidae, Liliaceae; Interesting features and systematic position of Cucurbitaceae, Cactaceae, Asteraceae, Amentiferae, Lemnaceae, Palmae, Orchidaceae.

**UNIT- III:**

Probable ancestors of angiosperms, primitive living angiosperms, speciation and extinction, IUCN categories of threat, distribution and global pattern of biodiversity.

**UNIT- IV:**

**Biological diversity** concept and levels, role of biodiversity in ecosystem functions and stability, Endemism, hotspots and hottest hotspots, invasions and introductions, local plant diversities and its socioeconomic importance.

**Practicals:**

**Major Exercises:**

1. Description of a specimen from representative, locally available families.
2. Description of a species based on various specimens to study intra specific variation: collective exercise.
3. Field trips within and around the campus; compilation of field notes and preparation herbarium sheets of such plants, wild or cultivated as are abundant.
4. Demonstration of the utility of secondary metabolites in the taxonomy of some appropriate genera.

**Minor Exercises:**

5. Description of various species of a genus, location of key characters and preparation keys at generic level.
6. Location of key characters and use of keys at family level.
7. Training in using floras herbaria for identification of specimens described in the class.
8. Comparison of different species of a genus and different genera of a family to calculate similarity coefficients and preparation of dendrograms.

M. Sc. Botany Syllabus  
**Semester III**  
 Course code- PSCBOTT09  
 PAPER –IX: **Plant Ecology**

**UNIT - I:**

**Vegetation organization:** Concepts of community and continuum, analysis of communities (analytical and synthetic characters): interspecific associations, concept of ecological niche.

**Vegetation development:** Temporal changes (cyclic and non-cyclic); mechanism of ecological succession (relay floristic and initial floristic composition; facilitation, tolerance and inhibition models); changes in ecosystem properties during succession, Autecology.

**UNIT - II:**

**Ecosystem organization:** Structure and functions; primary production (methods of measurement, global pattern, controlling factors); energy dynamics (trophic organization, energy flow pathways, ecological efficiencies); litter fall and decomposition (mechanism, substrate quality and climatic factors); global biogeochemical cycles of C, N, P, and S; mineral cycles (pathways, processes, budgets) in terrestrial and aquatic ecosystems.

**UNIT - III:**

**Air, Water and Soil pollution:** Kinds; sources; quality parameters; effects on plant and ecosystems.

**Climate change:** Greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFCs; sources, trends and role); ozone layer and ozone hole; consequences of climate change (Global warming, sea level rise, UV radiation).

**UNIT - IV:**

**Ecosystem stability:** Concept (resistance and resilience); Ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems; ecology of plant invasion; environmental impact assessment; ecosystem restoration.

Ecological management: Concepts; sustainable development; sustainability indicators.

**Practicals:**

1. A trip to the grass land/ forest/ water body to get acquainted with their plant species.
2. Distribution pattern of different plant species determined by Quadrat/ Transat/ Point centered Quadrat methods.
3. Qualitative parameters of distribution of plant species, Frequency, Density, Basal cover, dominance, Abundance and IVI.
4. Analysis of soils of two different areas i.e. Cropland and forest/ grassland for certain nutrients, CO<sub>3</sub>, NO<sub>3</sub>, Base deficiency.
5. Analysis of water quality for physical properties like colour, BOD, COD, O<sub>2</sub>, CO<sub>2</sub> contents etc.
6. Study of adaptations in plants of Hydrophytic, Xerophytic and Halophytic zones.