DEPARTMENT OF BOTANY

B.Sc. BOTANY
SYLLABUS

Choice Based Credit System

(For those who joined in June 2015 and after)
ABOUT THE COLLEGE

Vivekananda College was started by Founder-President Swamiji Chidbhavanandhaji Maharaj of Sri Ramakrishna Tapovanam, Tirupparaithurai, Trichy in 1971 on the banks of the river Vaigai which is blissfully free from the noise and hurry, the crowds and distraction of the city.

Vivekananda College is a residential college functioning under Gurukula pattern. It is Man-making education, that is imparted in this institution, Culture, character and curriculam are the three facets of ideal education that make man a better man. This is possible only when the teacher and taught live together, The Gurukula system of Training is therefore a humble and systematic attempt in reviving the age old GURUGRIHAVASA for wholesome education, Attention to physical culture, devotion to duty, obedience to teachers, hospitality to guests, zest for life, love for the nation, and above all, humility and faith in the presence of God etc. are the values sought to be inculcated. All steps are taken to ensure the required atmosphere for the ideal life training.

Vivekananda College, Tiruvedakam West, Madurai District-625 234 is an aided college established in 1971 and offers UG and PG courses. This College is affiliated to the Madurai Kamaraj University, Madurai. The College was reaccredited with ‘A’ grade (CGPA 3.59 out of 4.00) by NAAC IN September 2015.

VISION AND MISSION

Our Vision: To raise an army of neo-graduates steeped in the hoary culture of the motherland and dedicated to serving her as potential leaders in the manifold spheres of national effort.

Our Mission: A harmonious enrichment of physical, emotional and intellectual facets of a student’s personality to bring out his inherent PERFECTION.

OBJECTIVES OF THE INSTITUTION

1. To inculcate spiritual, ethical, moral and social values in all disciplines of study.
2. Simultaneous education of the Hand, Heart and Head. Only a sound body can hold a sound mind.
3. Provide opportunities for all round development of the students and excellence in higher education, research and extension in different disciplines.
4. Disseminate the findings of research to the community to facilitate its development.
5. To provide society citizens of sterling character.
6. To cater to the needs of the educationally backward people – the most backward, scheduled caste and tribe.
GURUKULA ADMINISTRATIVE SET UP

Secretary
Swami Niyamananda Maharaj
Principal
Dr. B. Ramamoorthy
Vice-Principal & NAAC Coordinator
Dr. S. Raja
Dean & Controller of Examinations
Dr. E. Jayakumar
IQAC Coordinator
Dr. S. Raja
IGNOU Coordinator
Sri. V. Parthasarathy
ICT Coordinator
Dr. N. Nagendran
Grievence Cell Coordinator
Dr. T. Kaliappan
Sessional Examination
Sri. P. Jayasankar, HOD of Physics
Sri. N. S. Lakshmikanthan
Sri. V. Rajendran
Dr. N. Meenakshi Sundaram
Sri. S. Ganeshan
Sri. S. Kalimuthu

I Eligibility For Admission

Admission to B.Sc. – Botany Programme is open to candidates with +2 pass with Maths, Physics, Chemistry, Biology, Botany and Zoology as major subjects.

For B.Sc.- Botany course offered in the college, a pass in the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate of the MKU, subject to such conditions as may be prescribed therefore.

II Duration

The course is for a period of three years. Each academic year shall comprise of two semesters viz. Odd and Even semesters. Odd semesters shall be from June to November and Even Semesters shall be from December to April. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of university end-semester examinations) for each semester.

III CBCS System

All Programmes offered in the college are run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

IV Semesters:

An academic year is divided into two semesters. In each semester, courses are offered in 15 teaching weeks. Each week has 30 working hours spread over 6 days a week.

V Credits:

The term 'Credit' refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits, required for completing the B.Sc. Programme is 140. The details of credits for individual components and individual courses are given in the above table.
VI Course:
Each Course is to be designed variously under lectures / laboratory / seminar / practical training / assignments to meet effective teaching and learning needs.

VII Examinations:
i). There shall be examinations at the end of each semester, for odd semesters in the month of October / November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in October / November or April/May.

ii). A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed or belated joining or on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the programme.

VIII Condonation
Students must have 75% of attendance in each paper for appearing the examination. Students who have 65% to 74% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 50% to 64% of attendance shall apply for condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination. They shall compensate the shortage after the completion of the programme.

IX Question Paper Pattern
Time: 3 Hours
Maximum Marks: 75

SECTION-A (10 X 1 =10 Marks)
Answer All Questions
(1-5) Multiple Choice
(6-10) Short Answer Questions
Two questions from each unit

SECTION-B (5 X 7 = 35 Marks)
Answer All Questions
(11-15) Questions shall be in the format of either (a) or (b)
One question from each unit

SECTION-C (3 X 10 = 30 Marks)
Answer any THREE Questions
(16-20) One question from each unit.

X Evaluation:
Performance of the students are evaluated objectively. Evaluation is done both internally and externally. They will be assessed continuously through Internal Assessment System and finally through summative (end) semester examination. To assess internally, there will be three examinations conducted centrally with a duration of two hours for each paper. In addition to continuous evaluation, the summative
semester examination, which will be a written examination of three hours duration, would also form an integral component of the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 25 : 75.

The pattern of internal valuation shall be:

- **Test**: 20 Marks (the average of best two tests out of three tests)
- **Assignment**: 5 marks
- **Total**: 25 marks

In respect of practical papers, the ratio of marks to be allotted to internal assessment and to summative (end) semester examination is 40 : 60. The internal marks will be calculated on the basis of marks secured at the model examination and marks awarded for the preparation of practical note book. The external marks will be calculated on the basis of the marks awarded by the internal examiner and the external examiner at the summative semester examination.

**XI Passing Minimum:**

There is no passing minimum for Internal Assessment. The passing minimum for external Examinations shall be 27 out of 75 marks and passing minimum for a paper is 40%.

**XII Classification of Students:**

Candidates who have secured not less than 40% of marks in each paper shall be declared to have passed in that paper. Candidates who obtain 40% and above but below 50% shall be declared to have passed in Third Class. Candidates who obtain 50% and above but below 60% of the aggregate marks in Part-III shall be declared to have passed in Second Class and those who obtain 60% of marks and above shall be placed in the First Class. Candidates who obtain 75% and above shall be declared to have passed in Distinction provided he has not re-appeared for any paper during the course of the study.

**XIII Failed Candidates:**

A candidate who has arrears in any paper in a semester examination will be permitted to proceed to the next semester classes. A candidate who has arrears may appear again in these failed papers at the November/April examinations. The internal assessment marks already obtained by him shall be carried over for the subsequent appearance also.

**XIV Improvement of Internal Marks:**

The student desirous of improving the internal assessment marks may request the Head of the Department. After obtaining permission from the Staff Council Meeting by the Head, the student may write improvement examinations in consultation with the course teacher. The marks obtained (when it is more than the previous marks) will be submitted to the Controller of Examinations for further adoption.

**XV Study Tour**

Students are expected to participate in the field visit and the study tours organized by the department. Though study tour/field trip carries no credit, it is compulsory for the students to attend whereby the students can get an opportunity to gain practical knowledge. As such, observational visit to selected social welfare organizations, industries, trade centres, exhibitions, places of historical importance and the like will be considered as extra-curricular activities.
VISION
To meet the growing global needs by educating students to excel in botany with a human touch.

MISSION
The mission is to give very good learning experience in understanding basics of botany and lab techniques with professional excellence and also produce academically proficient, professionally competent and socially responsible graduates in Botany.

OBJECTIVES
On doing the course Students will be able to:
- Know about the core concepts in the subject namely the plant kingdom.
- Exhibit proficiency in selected laboratory skills
- Make use of knowledge in the field of horticultural, Mushroom, and Medicinal botany in their day today life.
- Acquire Skills on Microbiology, Biotechnology and Bioinformatics techniques.
- Get involved in activities through which serve society for its welfare.
- Apply their skills in government, academic or industrial organizations and research institutions.
- Giving basic degree to become teaching professionals.
- Preparing them for various competitive examinations.

BRIEF HISTORY OF THE DEPARTMENT
The Botany Department was started in the year 1982 with UG & Allied Botany. The department has four sanctioned teaching staff and 2 academic support staff (technical) and administrative staff. Currently there are 4 faculty members in the department, 2 are aided & 2 as management appointee in the permanent vacancy. All the four faculty members are doctorates.

The department library has nearly 2000 books of national & international standard, and also has well equipped laboratories with enough chemicals and instruments. Totally 80 students are studying in our department.

Students are studying zoology and chemistry as allied subjects. Non Major Elective courses are conducted for our college under graduates students.

Apart from the core curriculum the Department also offers a number of extra-Departmental courses such as Horticulture, Energy Resources, Mushroom Cultivation and Medicinal Botany etc.

Prof S. RAJARAM Served the dept as founder HOD for the longest term (35 years) and retired in the year 2013. Prof G.SENTHILKUMAR rendered his service as Associate Professor for nearly 30 dedicated years and retired in the year 2014. Dr P.T. MANOHARAN elected to Madurai Kamaraj University as Academic Council, Senate and Syndicate Member earned name and fame to our Department and College. Both Dr P.T. MANOHARAN and Dr. N. LAKSHMANAN are recognised supervisors for guiding Ph.D students. Dr.V.RAMESH published a paper in an international journal.
### SCHEME OF EXAMINATION
(For those who join in June 2015 and After)

#### FIRST SEMESTER

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**TOTAL**

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## SIXTH SEMESTER

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CBCS - DISTRIBUTION OF CREDIT
B.Sc. BOTANY
(For those who joined in June 2015 and after)

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FACULTY MEMBERS

Dr. N. LAKSHMANAN, M.Sc., M.Ed., M.Phil., DGT., PGDT., PGDCA., Ph.D.,
Head, Associate Professor of Botany

Dr. P.T. MANOHARAN, M.Sc., M.Phil, PGDCA., Ph.D.
Associate Professor of Botany

Dr. V. RAMESH, M.Sc., DCA, Ph.D.,
Assistant Professor of Botany

Dr. T. SELLATHURAI, M.Sc., Ph.D.,
Assistant Professor of Botany

Dr. C. SOUNDAR RAJU, M.Sc., B.Ed., Ph.D.,
Assistant Professor of Botany
B.Sc. Botany CBCS Syllabus - SEMESTER - I
(For those who join in June 2015 and after)

<table>
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<tr>
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<tr>
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**Objectives**

- To acquire the basic knowledge of primitive plants kingdom
- To understand the evolution plant kingdom
- To know the importance of algae and bryophytes

**UNIT I**: General classification based on Fritsch-Class level only – Economic importance of Algae

**UNIT II**: Structure and reproduction of

- a. Chlorophyceae - *Oedogonium*
- b. Xanthophyceae - *Vaucheria*
- c. Bacillariophyceae - *Diatoms*

**UNIT III**: Structure and reproduction of the following

- a. Phaeophyceae - *Sargassum*
- b. Rhodophyceae - *Polysiphonia*
- c. Cyanophyceae - *Nostoc*

**BRYOPHYTES**

**UNIT IV**: Classification of Bryophytes based on Smith – Structure and reproduction of Hepaticae - *Marchantia* and *Anthoceros*

**UNIT V**: Structure and reproduction of Musci - *Funaria*

**Text Books:**

**Reference Books:**
3. An introduction to Embryophyta –Bryophytes - N.S. Parihar, Surjeet Publications, Delhi, 2014 Ed.
B.Sc. Botany CBCS Syllabus - SEMESTER - I
(For those who join in June 2015 and after)

<table>
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Objectives

- To acquire the basic knowledge about primitive plants kingdom
- To understand the symptomology of diseases thereby gaining knowledge on prevention of diseases
- To recognize the beneficial and harmful fungi for human life

FUNGI

UNIT I: Classification of Fungi based on Alexopoulos and Mims – Economic importance of Fungi

UNIT II: Structure and reproduction of the following
a. Myxomycetes : Stemonites
b. Oomycetes : Albugo
c. Ascomycetes : Penicillium

UNIT III: Structure and Reproduction of the following:
 a. Basidiomycetes : Puccinia and Agaricus
 b. Deuteromycetes : Cercospora

UNIT IV: Structure, Reproduction and economic importance of Lichens

PLANT PATHOLOGY

UNIT V: Symptoms, causes and control of the following diseases
a. Viral disease - Bunchy top of Banana
b. Bacterial disease - Citrus canker
C. Fungal disease - Blast disease in Rice
d. Mycoplasma - Little leaf of Brinjal

Text Books:
1. Fungi - B.R. Vashista, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Botany for Degree Students Fungi - P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. Plant pathology - B.P. Pandey, Chand & Company Ltd, Delhi, 2014 Ed.

Reference Books:
1. Making suitable micro preparations of types prescribed in Algae, Bryophytes, Fungi and plant pathology.
2. Identifying the plant diseases.
3. Making Observations of permanent slides on algae and fungal structures.
4. Observing and identifying the specimens at sight and writing explanatory notes on them.
5. Observing and identifying the bryophytes slides included in the syllabus
B.Sc. Botany CBCS Syllabus - SEMESTER - I
(For those who join in June 2015 and after)

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**Objectives**
- To know the various kinds of renewable and nonrenewable energy sources
- To acquire the importance of energy resources to prevent the extinction of energy resources
- To know the alternative energy resources

**UNIT I**
Sources of energy – conventional and non conventional-Present world Energy scenario.

**UNIT II**
Conventional energy- coal, oil, gas, thermal power and nuclear energy.

**UNIT III**
Non-Conventional - Solar energy-advantages-solar gadgets available Solar energy utilization in India and Hydro power.

**UNIT IV**
Wind energy – advantages and disadvantages-wind mills and Tidal energy.

**UNIT V**
Biomass energy – Biogas production, bioethanol, biodiesel (from plant lipids and from hydrocarbons)

**Text Books:**
2. Environmental science engineering - C.P. Venugobal Rao, PHI Learning New Delhi, 2010 Ed.

**Reference Books:**
2. Environmental studies – SK.Grarg, Khanna Pub Delhi, 2012 Ed.
B.Sc. Botany CBCS Syllabus - SEMESTER - II
(For those who join in June 2015 and after)

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Objectives

- To acquire the basic knowledge about primitive terrestrial plants
- After studying this paper Students will be able to identify in the field the forms prescribed in the syllabus and appreciate their ecological importance
- Students will be able to understand the chronological events that have taken place in the earth

PTERIDOPHYTES

UNIT I: General classification based on Smith (1955) - Structure and reproduction of the following
- a. Psilotales - Psilotum
- b. Lycopodiales - Lycopodium

UNIT II: Structure and reproduction of the following
- a. Equisetales - Equisetum
- b. Filicales - Marselia

GYMNOSPERMS

UNIT III: Classification according to Sporne (1965) - Structure and reproduction of the following
- a. Cycadales - Cycas
- b. Gnetales - Gnetum

PALEOBOTANY

UNIT IV: Geological era - Formation of fossils – types of fossils

UNIT V: Detailed study of the following
- a. Psilopsida - Rhynia
- b. Sphenopsida - Calamites
- c. Cycadofilicales - Lyginopteris

Text Books:

Reference Books:
B.Sc. Botany CBCS Syllabus - SEMESTER - II
(For those who join in June 2015 and after)

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Objectives
- To acquire the basic knowledge about internal tissues of plant
- To train the students in handling microscopes
- Training the students in various staining techniques

PLANT ANATOMY

UNIT I
A. Cell wall – Chemical nature of cell wall- Ultra structure of cell wall – Plasmodesmata and pits.
B. Tissue system – Meristems, Simple tissues, Complex tissues, Secretary Tissues and Trichomes.

UNIT II
Primary structures of dicot stem, monocot stem, dicot root, and Monocot root

UNIT III
a. Normal secondary thickening in dicot stem and dicot root
b. Anomalous secondary growth in Boerhaavia and Dracaena

UNIT IV
Internal structure of Dicot leaf - Nodal anatomy of Justicia, Azadirachta and Aralia – Lateral roots formation.

UNIT V MICROTECHNIQUES
Fixation of plant materials-sectioning of plant materials (hand section only) – staining and mounting and whole mount preparation.

Text Books
1. Plant anatomy - P.C.Vashista, S.Chand & Company Ltd, Delhi, 2012 Ed.

Reference books
1. Introduction to Plant anatomy - Eames & Mac Daniels, Tata McGraw Hill Education in India, 2010 Ed.
3. Plant micro technique - Donald Alexander Johnson
PART - III : – Core Subject Practical – II

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1. Making suitable microprepartion of types prescribed in Pteridophytes and Gymnosperms and plant anatomy
2. Identifying the specimens studied
4. Observing and identifying the specimens at sight and writing explanatory notes on them.
5. Observing and identifying the fossil slides included in the syllabus
6. Micro techniques – demonstration only.
PART – IV : Non Major Elective

Subject Title: GARDENING

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Objectives

- To acquire the basic knowledge about the improvement of hybrids of plant
- To know the various types of ecofriendly environment in front of homes
- To know the simple practice for the improvement of innovative garden

UNIT I:
Introduction to gardening – types of garden-Advantages of gardening

UNIT II
Propagation methods like cutting, layering, Grafting, budding, division and separation

UNIT III
Garden operations: Transplanting methods (Bare rooted, shifting and balling and burlapping), irrigation (surface, spray and drip) manuring

UNIT IV
Ornamental gardening, Indoor gardening, Rockery, Bonsai and Lawn making, Terrarium, Aquarium, Terrace garden, Veranda garden and Hanging baskets

UNIT V
Kitchen gardening – importance, layout, suitable plants and advantages

Text Books:

Reference Books:
PART – III : Core Subject Theory

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Objectives
- To learn the structure, classification and properties of macro molecules
- To understand the principles of energy production of biological systems
- To train the students in basic statistical methods used in interpreting scientific data

UNIT I Biomolecules
Carbohydrates: Classification, Structure and Properties of Monosaccharides only, Lipids - Types and properties only - Nucleic acids – Structure of DNA and types of RNA.

UNIT II Proteins
Structure and functions of Proteins only. Amino acids – Types and Properties only - Enzymes – Classification, properties and enzyme action.

UNIT III - Biophysics

UNIT IV – Photobiology

UNIT V Biostatistics
Collection, tabulation and interpretation of data, Measures of central tendencies (Mean, Median, Mode) Measures of dispersion (Standard deviation and standard error)

Text Books:

Reference Books:
PART – III : Core Subject Theory

**Subject Title: Bioinformatics**

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**Objectives**

- To understand the basics, needs and applications of Bioinformatics
- To enable the students to use this course for their future research programs
- To know various websites connected with Bioinformatics

**UNIT I**


**UNIT II**


**UNIT III**

Sequence analysis – Pairwise sequence alignment and multiple sequence alignment - similarity search tools-BLAST and FASTA and Phylogenetic tree Constructions

**UNIT IV**

Genomics – History and perspectives in genomic sciences – Prokaryotic and Eukaryotic genomics – Techniques for genomic studies (PCR) – Introduction to RAPD & RFLP

**UNIT V**

Proteomics – Introduction – Terminologies used in proteomics – Proteome analysis.

**Text Books:**

2. Introduction to Computers – Alexix Leond Mathew, Leon Techniques, 2010 Ed.

**Reference Books:**

B.Sc. Botany CBCS Syllabus - SEMESTER - III
(For those who join in June 2015 and after)

PART – III : Core Subject  Practical – III

| Subject Title: Biochemistry, Biophysics, Biometrics & Bioinformatics |
|--------------------------|--------------------------|
| Subject Code: 08CP33     | Hours per week:          |
| Sessional Marks: 20      | Summative Marks: 30      |

| Credit: 2               | Total Marks: 50          |

1. Determination of Complementary colours
2. Verification of Beer’s Law
3. Measurement of pH
4. Preparation of Buffers
5. Titration curve of weak acid
6. Titration curve of Strong acid
7. Preparation of standard graph for starch
8. Estimation of starch in a given material
9. Circular paper chromatography – Dyes
10. Ascending paper chromatography – Aminoacids
11. Calculate the standard deviation of the given material
12. Making suitable graphs for the data using chart wizard
13. Observing and identifying the spotters at sight and writing explanatory notes on them.
B.Sc. Botany CBCS Syllabus - SEMESTER - III
(For those who join in June 2015 and after)

| PART – IV : Skill Based Subject |
|-----------------|-----------------|-----------------|
| Subject Title:  | Bioinstrumentation |                |
| Subject Code:   | 08SB31           | Hours per week: 2 |
| Sessional Marks:| 25               | Credit: 2        |
| Summative Marks:| 75               | Total Marks: 100  |

Objectives
- To acquire practical knowledge of using various instruments and carry out experiments with them
- To know the principles of instruments used in biology
- To know the importance of bioinstruments

UNIT I
Microscopy - The working principles of microscope-comparison of phase contrast and fluorescence microscopes-Electron microscope TEM and SEM  Micrometry – ocular and stage

UNIT II
Colorimetry and pH metry, basic principles and application of Colorimeter and pH meter

UNIT III
Centrifugation - Basic principles and types of centrifuges, Application of analytical ultra centrifuge

UNIT IV
Chromatographic techniques - Basic principles and Types (Paper, TLC and Column chromatography)

UNIT V
Electrophoretic methods - Principles and types (PAGE)

Text Books:

Reference Books:
2. A biologist’s guide to principles and techniques of Practical Biochemistry - Goulding & Wilson, ELBS, 2010 Ed.
3. Instrumental analysis for science and technology – Weferren, Agrobios India, 2010 Ed.
PART – III : Core Subject Theory

Subject Title: **Cell Biology and Embryology**

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**Objectives**

- To understand the modern concept of cell structure, components and function
- To apply knowledge from cell biology in biotechnology
- To acquire knowledge on the development of embryo in plant

**UNIT I**


**UNIT II**

Cell cycle, Cell division types - Mitosis and meiosis and their significance.

**UNIT III**

Structure of microsporangium, microsporogenesis and development male gametophytes.

**UNIT IV**

Structure of megasporanigium, megasporogenesis, formation of female gametophytes (*Polygonum, Allium, Peperomia*) and Fertilization.

**UNIT V**

Endosperm – types – formation and significance - Embryo – development of dicot embryo – *Capsella*, development of monocot embryo – *Luzula*

**Text Books:**


**Reference Books:**

B.Sc. Botany CBCS Syllabus - SEMESTER - IV
(For those who join in June 2015 and after)

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**Objectives**

- To create an awareness among the students on environmental problems and conservation.
- To help the learners to understand the hazards of pesticides.
- To understand the principles of Phytogeography – various ways of plant distribution

**UNIT I: ECOLOGICAL FACTORS:**

a) Climatic factors – Light, Temperature and wind
b) Biotic factors – interaction among plants, interaction between plants and animals
c) Edaphic factor – Composition of soil – Origin and formation of soil – soil profile – soil erosion and soil conservation.

**UNIT II: ECOLOGICAL GROUPS AND SUCCESSION**

a) Ecological groups – Xerophytes, Hydrophytes and Halophytes
b) Succession – Kinds of succession – Process of succession – Types of succession – Xerosere and Hydrosere

**UNIT III: STUDYING VEGETATION**

a) Methods of studying vegetation – Quadrat method only.
b) Vegetation of India and Tamil Nadu

**UNIT IV: ECO-TOXICOLOGY**

Hazards of pesticides – Effects of pesticides on animal life – effects on plants – effects on human life.

**UNIT V: PHYTOGEOGRAPHY**

Distribution of plants – continuous and discontinuous distribution – Continental drift - Endemism – Age and Area hypothesis.

**Text Books:**

2. Environmental science and engineering – P. Venugobal Rao, PHI Learning, New Delhi, 2010 Ed.

**Reference Books:**

3. Environmental Pollution and Toxicology - Ray Chandhuri & Gupta, periodical experts Book Agency, 2013 Ed.
B.Sc. Botany CBCS Syllabus - SEMESTER - IV
(For those who join in June 2015 and after)

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<td>Subject Code: 08CP43</td>
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<tr>
<td>Hours per week:</td>
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<tr>
<td>Sessional Marks: 20</td>
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</tbody>
</table>

1. Onion Root tip squash to observe mitosis cell division
2. Rheo Flower bud squash to study meiosis
3. Non-living inclusion – Raphides & cystolith
4. Electron microphotographs – showing the ultra structure of cell organelles.
5. T.S. of anther to study various stages of microsporogenesis
6. Types of ovules (slides)
7. Embryo mounting – Cucumis
8. Study of xerophytes, hydrophytes and halophytes
9. Internal structure of Nerium leaf, Casuarina stem, Hydrilla stem and Nymphaea petiole
PART – IV : Skill Based Subject

<table>
<thead>
<tr>
<th>Subject Title: Horticulture</th>
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<tbody>
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<td>Summative Marks: <strong>75</strong></td>
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<tr>
<td>Total Marks: <strong>100</strong></td>
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</table>

Objectives

- To provide theoretical and practical aspects of gardening to enable the students to be self reliant knowledge and self employment
- To know the various types of ecofriendly environment in front of homes
- To know the simple practice for the improvement of innovative garden

UNIT I
Introduction to Horticulture-types of gardening-indoor, public and dam gardens

UNIT II
Propagation techniques-methods of cutting, layering, grafting and budding

UNIT III
Cultural practices: Transplanting methods (bare rooted, shifting and balling, burlapping, potting and repotting) irrigation and manuring

UNIT IV
Horticultural techniques- disbudding, ringing, notching, smudging and pruning

UNIT V
Kitchen gardening-layout and maintenance, indoor gardening, rockery, Bonsai and lawn

Text Books

Reference Books
B.Sc. Botany CBCS Syllabus - SEMESTER - V
(For those who join in June 2015 and after)

PART – III : Core Subject Theory

<table>
<thead>
<tr>
<th>Subject Title: Taxonomy of Angiosperms &amp; Economic Botany</th>
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<tbody>
<tr>
<td>Subject Code: 08CT51</td>
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<td>Sessional Marks: 25</td>
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</table>

Objectives

- To study the floral characters with an aim to identify the taxa authentically
- To prepare taxonomic keys with the help of morphological and floral characters
- To acquire knowledge on useful plant products and its proper application to wellbeing of human

UNIT I

UNIT II
Field and herbarium techniques Modern trends in taxonomy (Chemo & Numerical)

UNIT III
Distinguishing features and economic importance of the following families: Annonaceae, Capparidaceae, Sterculiaceae, Meliaceae, Rutaceae, Caesalpinaceae, Mimosaceae, Cucurbitaceae and Apiaceae

UNIT IV
Distinguishing features and economic importance of the following families: Rubiaceae, Asteraceae, Asclepiadaceae, Solanaceae, Scrophulariaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae, Orchidaceae, Arecaceae & Poaceae.

ECONOMIC BOTANY:

UNIT V: Fibres and fibre yielding plants
Spices and condiments
Resins and gums
Processing and extraction of sugar & tea

Text Books:
1. Taxonomy of Angiosperms- B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.

Reference Books:
1. Economic Botany-B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
B.Sc. Botany CBCS Syllabus - SEMESTER - V
(For those who join in June 2015 and after)

<table>
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<tbody>
<tr>
<td><strong>Subject Title:</strong> Genetics</td>
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<td><strong>Hours per week:</strong> 4+3</td>
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<td><strong>Summative Marks:</strong> 75</td>
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<td><strong>Total Marks:</strong> 100</td>
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**Objectives**
- To acquire knowledge on Genetics (classical to Modern)
- To understand the Gene regulation in prokaryotes
- To know the significance of mutations

**UNIT I - Classical Genetics**

a) Mendel’s laws of heredity with reference to mono and dihybrid crosses – incomplete dominance.
b) Modification of 9:3:3:1 due to
   i) Complementary genes
   ii) Dominant epistasis
   iii) Recessive epistasis

**UNIT II**

i. Multiple alleles with reference to A, B, O blood groups in man
ii. Linkage and Cross over – theories of crossing over – significance of crossing over
   iii. Mechanism of sex determination in plants.

**UNIT III**

i) Sex linked inheritance
   ii) Extrachromosomal inheritance – Male sterility in Maize – plastid inheritance

**UNIT IV**

Chromosomal aberrations types (intrachromosomal-deletion, addition & inversion; interchromosomal translocation) genetic significance of mutations-mutagens

**UNIT V**

Human genome project
Gene regulation in prokaryotes.

**Text Books:**

**Reference Books:**
B.Sc. Botany CBCS Syllabus - SEMESTER - V
(For those who join in June 2015 and after)

PART - III : Core Subject Theory

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<td>Credit: 3</td>
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<tr>
<td>Summative Marks: 75</td>
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<tr>
<td>Total Marks: 100</td>
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</table>

Objective:
- To acquire basic knowledge on microbes
- To know the importance of microbes in day today life.
- To know the value of immune system immunity

Unit I
Introduction to Microbiology – Microbial diversity – General features and structure of Bacteria, Viruses, Yeast and Cyanobacteria – Staining of Bacteria

Unit II
Control of Microorganisms – Use of Physical and Chemical agents in sterilization process - Role of Antibiotics and Chemotherapeutic agents.

Unit III
Nutrition and Microbial growth – Culture media – Measurement of growth – Growth Curve – Control of growth - Role of antimicrobial agents on growth.

Unit IV
Microbial Metabolism – Photosynthesis – Light reactions of Purple Sulfur bacteria, Purple Non - Sulfur bacteria, Green Sulfur bacteria, Green Non- Sulfur bacteria – Dark reaction Reverse TCA Cycle Fermentation – Lactic acid and Ethanol fermentation.

Unit V
Immunology- Brief account of Immune system (Lymphoid organs, Lymphocytes, Phagocytes), Types of Antigen, Antibody Structure, Types and Function – Brief account of Antigen – Antibody reaction.

Text Books:
1. Microbiology and immunology – Ajit Kumar Banerjee, New Central Book Agency Delhi, 2012 Ed.

Reference Books:
PART – III : Core Subject Practical - V

Subject Title: Taxonomy Of Angiosperms, Economic Botany, Genetics & Microbiology

<table>
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<th>Hours per week:</th>
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</table>

1. Identifying, observing and sketching the floral parts of the plants belonging to the families included in the syllabus.

2. Spotters may be given for practical from economic Botany


4. Working on genetics problems in Mono, Dihybrid ratios and interaction of genes.

5. Sterilization, Media preparation, Serial dilution, Staining of Bacteria – simple and gram staining.
PART – III : Elective Subject

<table>
<thead>
<tr>
<th>Subject Title: Medicinal Botany</th>
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<tbody>
<tr>
<td>Subject Code: 08EP51</td>
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<td>Hours per week: 5</td>
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<td>Credit: 5</td>
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<td>Sessional Marks: 25</td>
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<tr>
<td>Summative Marks: 75</td>
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<tr>
<td>Total Marks: 100</td>
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</table>

Objectives

- To acquire knowledge on botanical diagnosis of fragmentary crude drugs
- To help the students to know preliminary photochemistry of plant organs
- To identify medicinal taxa

UNIT I

Pharmacognosy – definition, scope, History, Indigenous system of medicine (Ayurveda, Unani & Siddha) – Classification of crude drugs (Alphabetical, Taxonomical, Morphological, Pharmacological, Chemical and Chemotaxonomical)

UNIT II

Products derived from plants (Secondary metabolites) pharmaceutically important products, their classification, properties, isolation and medicinal uses of the following Alkaloids, Tannins, Phenols, Resins and gums

UNIT III

Collection and processing of crude drugs- harvesting, drying, garbling, packing and storage of crude drugs, Drugs adulteration- types of adulterants – methods of drug evaluation (Physical, chemical, biological and organoleptic) Evaluation and Pharmacopoeia standards.

UNIT IV

Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of the following:

- Stem & Tuber - Zingiber officinale
- Bark & wood - Cinnamomum zeylanicum, Santalum album
- Leaves - Cassia senna
- Buds & flowers - Eugenia caryophyllota
- Fruits - Aegle marmelos
- Seeds - Myristica fragrans
- Resins and Gums - Ferula asafoetida

UNIT V

Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of the following
Ashwaganda - *Withania somnifera*
Sothukathalai - *Aloe vera*
Nelli - *Emblica officinalis*
Safflower - *Carthamus tinctorius*

**Text Books:**


**Reference Books**

2. Medicinal Plants-Anil Kumar, Inter. Sci. Publishing Academy, New Delhi, 2014 Ed.
OBJECTIVES

- To acquire basic knowledge on mushrooms
- To know the importance of mushrooms
- To know the value of mushrooms in day today life

UNIT I
Introduction, Types of mushroom, edible and poisonous mushroom.

UNIT II
Life Cycle of Pleurotus sp. Agaricus sp, improvement of mushroom strains

UNIT III
Cultivation – isolates, spawn production, growth media, spawn running and harvesting of mushrooms.

UNIT IV
Post harvest technology, pests and diseases in mushrooms.

UNIT V
Harvesting, Freezing, Drying, Packaging and Marketing. Mushroom recipes and Nutritional value of mushrooms.

TEXT BOOKS:
2. Mushroom Cultivation, 2005 - Singh

REFERENCE BOOKS:
1. Mushroom a manual of cultivation – Biswal Subrata, PHI Learning Pvt Ltd, Delhi, 2012 Ed.
2. Mushroom Cultivation, 2005 – Suman
B.Sc. Botany CBCS Syllabus - SEMESTER - V
(For those who join in June 2015 and after)

<table>
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<th>Part – IV : Common Subject Theory</th>
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<td><strong>Subject Title:</strong> Environmental studies</td>
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<td>Summative Marks: 75</td>
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</table>

**Objectives**
- Disseminate information of Environment of national and international issues
- Environmental consciousness creation among the students
- Facilitation of environmental leadership among students

**Unit-I**

5 hrs

Introduction – Nature, scope and importance of Environmental studies – Natural Resources and conservation – forest, water and energy.

**Unit-II**

5 hrs

Ecosystem – concept – structure and function, energy flow, food chain, food web and ecological pyramids.

**Unit-III**

5 hrs

Biodiversity – definition, types – values – India, a mega diversity zone – Hotspots – Endangered and endemic species – threat to biodiversity and conservation

**Unit-IV**

5 hrs


**Unit-V**

4 hrs


**Text books**

Environment studies – R.Murugesan (2009), Milleneum Pub. Madurai-16
B.Sc. Botany CBCS Syllabus - SEMESTER - VI
(For those who join in June 2015 and after)

<table>
<thead>
<tr>
<th>PART – III : Core Subject Theory</th>
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<td>Subject Title: <strong>Plant Physiology</strong></td>
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<table>
<thead>
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<th>Hours per week: 5+3</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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</table>

**Objectives**

- To study the organization and physiology of plants
- To acquire the basic knowledge of cellular basis of physiological functions.
- To know the mechanism in plant metabolic activities such as photosynthesis, respiration and transpiration

**UNIT I: PLANTS AND WATER RELATIONS**

  a) Diffusion – osmosis – water potential concept – plasmolysis
  b) Mechanism of absorption of water – factors affecting absorption
  d) Ascent of Sap: Mechanism of water movement.

**UNIT II:**


**UNIT III:**

  b) Lipid metabolism - Synthesis of glycerol and fatty acids – condensation of glycerol and fatty acids – β oxidation of fatty acids.

**UNIT IV: MINERAL NUTRITION**

  a) Role of macro and micro elements – mechanism of absorption of minerals.
  b) Enzymes – Classification, properties – enzyme action – enzyme inhibitors.
  c) Mechanism of translocation of solutes.
UNIT V: GROWTH AND DEVELOPMENT

a) Growth – definition – Physiological effects of Growth hormones (Auxins, gibberellins, Cytokinins and ethylene)

b) Physiology of flowering – Photo periodism and Vernalization.

c) Seed dormancy.

Text Books:

1. Plant Physiology – Suraj Mandal, Campus Books, New Delhi, 2014 Ed.
3. Plant Physiology - Jain, V.K, S.Chand & Company Ltd, Delhi, 2013 Ed.

Reference Books

Objectives
- To keep the students abreast of all the latest developments in Biotechnology
- To provide insights into advanced aspects of Agriculture, Environment and Medicine
- To expand the knowledge of the students in Biotechnology.

UNIT I - DNA Biotechnology

UNIT II Industrial Biotechnology
Industrial production of ethyl alcohol, citric acid and penicillin. Immobilization of enzymes and single cell proteins.

UNIT III Agricultural Biotechnology
Types of Potential Biofertilizers – mechanism of Nitrogen Fixation with reference to Rhizobium – root nodulation – nif genes – regulation of nif genes - Brief account of Biopesticides

UNIT IV Environmental Biotechnology
Biological treatment of sewage – Biogas and methanogenesis – biofuels Bioremediation of contaminated soil and brief account of Phytoremediation.

UNIT V Medical Biotechnology
Diagnostic procedure- ELISA & DNA based diagnostics Brief account of Gene therapy – definition and types (nonclassical gene therapy-somatic cell therapy, germ line therapy and stem cell therapy ; classical gene therapy) DNA finger printing Production of health care products – insulin, Human growth Hormone and monoclonal antibodies.

Text Books:
3. A text Book of Biotechnology – R.C. Dubey, S.Chand & Company Ltd, Delhi, 2014

Reference Books:
Experiments carried out by the students
1. Measurement of OP by Chardakov’s method
2. Measurement of OP by Gravimetric method
3. Measurement of rate of Transpiration – Ganong’s Potometer
4. Transpiration equals absorption
5. Effect of light on Photosynthesis
6. Effect of CO₂ concentration on Photosynthesis
7. Separation of Leaf Pigments – Paper Chromotography
8. Find out the Respiration Quotient of the given material

Experiments for demonstration only
1. Four leaf experiment
2. Foliar transpiration
3. Ganong’s Light screen
4. Ganong’s Respiroscope
5. Mohl’s half-leaf experiment
6. Evolution O₂ during Photosynthesis
7. Arc Auxanometer
8. Clinostat
9. Phototropism
10. Kuhen’s fermentation vessel
11. Demonstration of Tissue culture experiment using explants.
12. Photographs – Callus, plasmids, Biogas, Phytohormones.
13. Visit to tissue culture and microbiology divisions of an industry
PART – III : Elective Subject

<table>
<thead>
<tr>
<th>Subject Title: Tissue Culture</th>
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</table>

Objectives
- To accommodate the recent developments in Plant Biotechnology
- To acquire knowledge in tissue culture
- To acquire practical knowledge in tissue culture techniques

UNIT I
Introduction - Milestones in plant tissue culture – tools required for tissue culture lab – Media preparation, sterilization techniques.

UNIT II
Explants - Initiation and maintenance of callus – organogenesis (Auxillary Bud culture, Nodal culture) Somatic embryogenesis – meristem culture – Artificial seeds – Germplasm preservation.

UNIT III
Isolation and purification of protoplast-Protoplast fusion and Somatic hybridization - Anther culture and haploid generation – use of haploids in plant breeding.

UNIT IV
Suspension culture – Production of secondary metabolites-some pharmaceutically important secondary metabolites and their plant sources (Alkaloids, Tannins, Phenols and Resins with examples.

UNIT V

Text Books:

Reference Books:
1. Plant cell and tissue culture – S. Narayanasamy, Tata McGraw Hill Company, Delhi, 2012 Ed
2. Introduction to plant cell, tissue and organ culture – D. Prohit Sunil, PHI Learning Private Ltd, Delhi, 2013 Ed.
OBJECTIVES
- To know the instruments employed in remote sensing
- To study the satellite data products; forest mapping
- To know the importance of remote sensing in forest management.

UNIT I: Introduction to Remote Sensing
Physical basis, EM Radiation, Sensor types, platforms.

UNIT II: Remote sensing instruments
Active and Passive instruments, Derivation of Information.

UNIT III: Remote Sensing Applications
Thematic applications, Integrated applications, NRSA and NNRMS, IRS and future mission.

UNIT IV: Geographical information system
Introduction, Definition, Components of GIS

UNIT V: GIS Application:
Introduction, Problem identification, Designing a model, Project Management and implementation.

Text Books:

Reference Books:
1. Principles of remote sensing an introductory textbook –Wim H. Bakker et al., the inter institute of aerospace survey and earth sciences, Netherlands 2010 Ed.
3. Physical basis of RS - George Joseph, 2005
PART – IV : Skill Based Subject

<table>
<thead>
<tr>
<th>Subject Code: 08SB61</th>
<th>Hours per week: 2</th>
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<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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Objectives

- To know the varieties released through the various methods of plant breeding
- To know the various types of ecofriendly environment hybrids production
- To know the simple practice for the improvement of innovative hybrids

UNIT I: Plant introduction:


UNIT II: Selection:


UNIT III: Hybridization:


UNIT IV: Heterosis

Definition – causes of heterosis – effects of heterosis – achievements in heterosis.

UNIT V:

Role of polyploids in plant breeding – Role of mutations in Crop improvement.

Text Books:

Reference Books:
B.Sc. Botany CBCS Syllabus - SEMESTER - VI
(For those who join in June 2015 and after)

<table>
<thead>
<tr>
<th>PART - IV : Skill Based Subject</th>
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<td><strong>Subject Code:</strong> 08SB62</td>
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<td><strong>Sessional Marks:</strong> 25</td>
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**Objectives**
- To introduce the various aspects of biodiversity to the students
- To spread across the message of preventing widespread biodiversity loss.
- To highlight the uses and values of biodiversity

**UNIT I: Biodiversity**
Definition – Levels of Biodiversity [Genetic, Species and Community and Eco System diversity] why biodiversity is rich in tropics?

**UNIT II: Loss of Biodiversity**

**UNIT III: Uses of biodiversity**
Consumptive use values, Product use values, social values, ethical, aesthetic, optimal and ecosystem service values.

**UNIT IV: Conservation of biodiversity**
Strategies followed in conservation – In-situ conservation – Protected areas network [sacred groves, biosphere reserves, National parks and wild life sanctuaries. Ex-situ conservation: Zoos, botanical gardens, seed banks, pollen storage, tissue culture and genetic engineering.

**UNIT V: Brief account of global diversity**
Hot spots found in India – biodiversity conservation of India - Role of IUCN, WWF and MAB programmers. Environmental Protection Act – Forest conservation act & Biodiversity act.

**Text Books:**
1. An advanced Text Book on Biodiversity - Krishnamurthy, K.V.
2. Biodiversity – K.C. Agarwal

**References Books:**
B.Sc. Botany CBCS Syllabus - SEMESTER - VI
(For those who join in June 2015 and after)

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<th>Part – IV: Skill Based Subject</th>
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<tr>
<td>Subject Code: 08SB63</td>
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**Objective:**
- To acquire knowledge in nano biology
- To obtain various skills in nanotechnology
- To learn the newer technologies for competency.

**Unit I: Nanotechnology**
Introduction – types – basic principles – areas of applications.

**Unit II: Cellular Machines**
Nanomaterial’s (Nano- tubes, Nano-wires, Nano- crystals, Nano- particles – Biomacromolecules (DNA and Protein structure).

**Unit III: Biosensors**
Enzymes and protein based sensing – DNA amplification, DNA probes and assays – Liposomes, Fluidics, Biomembranes and Biochips.

**Unit IV: Nanomedicine**
Importance in diagnostics – Biocompatibility – diseases and Therapeutics.

**Unit V: Nanotechnology and Agriculture**

**Text Books:**

**Reference Books:**
PART – IV : Common Subject Theory

<table>
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<td>Total Marks</td>
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</table>

UNIT I: The heart of Education

UNIT II: The Value of Body and Life Energy
Introduction – what are the causes for paid, Disease and death? Three Basic needs for all living Beings – Personal Hygiene Five Factors of Balance in Life – The need and benefits of physical Exercise – The value and Base of Life energy – The value and Base of Bio-magnetism - You are your own best caretaker.

UNIT III: Analysis of Thought

UNIT IV: Moralisation of Derive
Introduction – moralization of desire - Analyse your desires – Summary of practice.

Neutralisation of Anger:
Introduction – meaning – characteristics of Anger – Anger is a Destructive emotion – Anger spoils our relationship with others – Some common misconception about anger – will power and method success through awareness – method of neutralisation of anger.

UNIT V: Eradication of Worries
Worry is a mental disease – Nature’s Law of cause and effect – factors beyond our control – How to deal with problems – analyse your problem and eradicate worry

Harmonious Relationships

Text Book: Value Education for Health, Happiness and Harmony
(Based on the Philosophy and Teachings of Swami Vethanthiri Maharishi)
Published by: Brain Trust, Aliyar A Wing of World Community Service Centre
UNIT-I: Community Development-I
Definition – structure and composition – community based issues – need for awareness – Developmental Programmes.

UNIT – II: Community Development–II

UNIT – III: Volunteer Empowerment

UNIT – IV: Social Analysis

UNIT – V: Introduction to NSS

(OR)

Reference: National Service Scheme Manual (Revised), Ministry of Human Resources Development, government of India.
B.Sc. Zoology Allied Botany CBCS Syllabus - SEMESTER - I
(For those who join in June 2015 and after)

<table>
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Objectives

- To understand the life history of cryptogams
- To understand the evolution of plants
- To learn to identify the different groups studied

UNIT I: ALGAE
General characters – Structure and reproduction of the following.
  a) Cyanophyceae - *Nostoc*
  b) Chlorophyceae – *Oedogonium*
  c) Phaeophyceae – *Sargassum*

UNIT II: FUNGI
General characters – Structure and reproduction of the following.
  a) Ascomycetes – *Penicillium*
  b) Basidiomycetes – *Puccinia*
  c) Lichens – Nature of association – habit and habitat - classification and morphology of lichen thallus. (Reproduction need not be discussed)

UNIT III: BRYOPHYTES
General characters – structure and life cycle of *Funaria*.

UNIT IV: PTERIODOPHYTES
General characters – structure and life cycle of *Lycopodium*.

UNIT V: GYMNOSPERMS
General characters – structure and life cycle of *Cycas*.

Text Books:

Reference Books:
2. Botany for Degree Students Algae – P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.
B.Sc. Zoology Allied Botany CBCS Syllabus - SEMESTER - II  
(For those who join in June 2015 and after) 

<table>
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<th>Part – III : Allied Subject Theory</th>
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<tr>
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<tr>
<td>Subject Code: 08AT02</td>
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<td>Sessional Marks: 25</td>
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Objectives

- To understand the life history of angiosperms
- To understand the mechanism of water movement in plants
- To know the various kinds of hormones involved in plants growth

UNIT I

Natural classification – Benthem and Hooker’s classification.

UNIT II: Studying the following families:

- Annonaceae, Caesalpiniaceae, Asclepiadaceae, Lamiaceae, Euphurbiaceae, Poaceae.

UNIT III: Plants and water relations

- Osmosis – water potential concept – Plasmolysis – Mechanism of Absorption of water and transpiration, Guttation.

UNIT IV: Photosynthesis

- Structure of chloroplast – Light reaction – Dark reaction – C₃ and C₄ cycles only.

UNIT V: Growth and development

a) Growth hormones – Auxins, Gibberellins and cytokinins.
b) Physiology of flowering – Photoperiodism and Vernalization.

Text Books:

1. Taxonomy of Angiosperms- B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.

Reference Books:

1. Plant Physiology – Suraj Mandal, Campus Books, New Delhi, 2014 Ed.
3. Plant Physiology - Jain, V.K, S.Chand & Company Ltd, Delhi, 2013 Ed.
B.Sc. Zoology Allied Botany CBCS Syllabus - SEMESTER - II
(For those who join in June 2015 and after)

<table>
<thead>
<tr>
<th>PART – III : Allied Subject Practical</th>
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<tbody>
<tr>
<td>Subject Title: <strong>Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms, Taxonomy and Plant Physiology</strong></td>
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<tr>
<td>Subject Code: <strong>08CP03</strong></td>
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<td>Sessional Marks: <strong>40</strong></td>
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</tbody>
</table>

1. Make suitable micropreparations of types prescribed in Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperm.
2. Identifying, observing and sketching the floral parts of the plants belonging to the families prescribed in the syllabus.
3. Demonstrating the following physiology experiments
   1. Four leaf experiment
   2. Foliar Transpiration
   3. Ganong’s Light screen
   4. Ganong’s Potometer
   5. Mohl’s half leaf experiment
   6. Evolution of O₂ during photosynthesis
   7. Arc Auxanometer
   8. Clinostat
   9. Phototropism
   10. Kuhne’s fermentation vessel
DEPARTMENT OF BOTANY

CERTIFICATE COURSE IN MEDICINAL BOTANY

UNIT: I
Pharmacognosy – definition, Scope, History, Indigenous system of medicine (Ayurveda, Unani & Siddha) – Classification of crude drugs (Alphabetical, Taxonomical, morphological, Pharmacological, chemical and Chetexonomical)

UNIT: II
Products derived from plants (secondary metabolites) pharmaceutically important products, their classification, properties, isolation and medicinal uses of the following Alkaloids, Tannins, Phenols, Resins and gums

UNIT: III
Collections and processing of crude drugs- harvesting, drying, garbling, packing and storage of crude drugs adulteration-types of adulteration –methods of drug evaluation (physical, biological, chemical, and organoleptic Evaluation of pharmacopoeia standards.

UNIT: IV
Medicinal uses of lower plants – Botanical names, common and vernacular names, morphological of the useful parts and medicinal uses of the following
- Stem& Tuber: Zingiber officinale
- Bark & Wood: Cinnamomum zelannicam, Santalum album
- Leaves: Cassia senna
- Buds & flower: Eugenia caryophyllota
- Fruits: Aegle marmelos
- Seeds: Myrsitica fragrans
- Resins and gums: Ferula asafetida

UNIT: V
Botanical name, common name, family, chemical constituents, cultivation, processing, harvesting and uses of the following Withania somnifera, Aloe vera, Emblica officinalis and Carthamus tinctorius

Text Books

Reference Books
DEPARTMENT OF BOTANY

CERTIFICATE COURSE IN HORTICULTURE

UNIT: I
Introduction to Horticulture-types of gardening-indoor, public and dam gardens

UNIT: II
Propagation techniques –methods of cutting, layering, grafting and budding

UNIT: III
Cutting practices: Transplanting methods (bare rooted, shifting and balling, burlapping, potting and reporting) irrigation and manuring

UNIT: IV
Horticulture techniques: disbudding, ringing, notching, smudging and pruning

UNIT: V
Kitchen gardening-layout and maintenance, indoor gardening, rockery, Bonsai and lawn

Text books

Reference Books