B.Sc. BOTANY
SYLLABUS: 2011

CHOICE BASED CREDIT SYSTEM (CBCS)

St. JOSEPH'S COLLEGE (Autonomous)
Re-accredited with A+ Grade by NAAC
College with Potential for Excellence by UGC
TIRUCHIRAPPALLI - 620 002
### B.Sc. Botany: Course Detail – 2011

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| I    | Language | 11UGT210002 | General Tamil-II/Hindi-II/French-II | 4   | 3      |
|      | English | 11UGE220102 | General English II | 5   | 3      |
|      | Major-Core | 11UBO230204 | Pteridophytes, Gymnosperms and Paleobotany | 5   | 4      |
|      | Major-Core | 11UBO230205 | Practical II: Pteridophytes, Gymnosperms, Anatomy and Embry. | 3   | 3      |
|      | Allied | 11UBO230403 | Allied: Zoology II | 4   | 3      |
|      | Allied | 11UBO230404 | Practical Zoology II | 2   | 2      |
|      | A. Core | 11UBO230501 | Anatomy and Embryology | 3   | (2)    |
|      | NMC | 11UCE240802 | Computer Literacy | 2   | 2      |
|      | V. Educ. | 11UFC241002 | Value Education – II: Fundamentals of Human Rights | 2   | 1      |
| Total for Semester II | 30 | 21 |

| I    | Language | 11UGT310003 | General Tamil-III/Hindi-III/French-III | 4   | 3      |
|      | English | 11UGE320103 | General English III | 5   | 3      |
|      | Major-Core | 11UBO330206 | Taxonomy of Angiosperms | 5   | 4      |
|      | Major-Core | 11UBO330207 | Practical III: Taxonomy of Angiosperms | 3   | 3      |
|      | Allied | 11UBO330405A | Allied: Chemistry for Biologists I (OR) | 4   | 4      |
|      | Allied | 11UBO330405B | Allied: Biometrics and Computer Applications I | 4   | 4      |
|      | V. Educ. | 11UFC341003A | Professional Ethics-I: Social Ethics (OR) | 2   | 2      |
|      | V. Educ. | 11UFC341003B | Professional Ethics-I: Religious Doctrine | 2   | 2      |
| Total for Semester III | 30 | 21 |

| I    | Language | 11UGT410004 | General Tamil-IV/Hindi-IV/French-IV | 4   | 3      |
|      | English | 11UGE420104 | General English IV | 5   | 3      |
|      | Major-Core | 11UBO430208 | Cell and Molecular Biology | 5   | 3      |
|      | Major-Core | 11UBO430209 | Practical IV: Cell & Molecular Biology, Genetics, Plant Breeding and Evolution | 3   | 3      |
|      | III Allied | 11UBO430406A | Allied: Chemistry for Biologists II (OR) | 4   | 4      |
|      | III Allied | 11UBO430406B | Allied: Biometrics and Comp. App. II | 4   | 4      |
|      | III Allied | 11UBO430407A | Allied: Chemistry for Biologists II Practical (OR) | 2   | 2      |
|      | III Allied | 11UBO430407B | Allied: Biometrics and Comp. App. II Practical | 2   | 2      |
|      | A. Core | 11UBO430502 | Genetics, Plant Breeding and Evolution | 4   | (2)    |
|      | IV V. Educ. | 11UFC441004A | Professional Ethics-II: Social Ethics (OR) | 2   | 2      |
|      | IV V. Educ. | 11UFC441004B | Professional Ethics-II: Religious Doctrine | 2   | 2      |
| Total for Semester IV | 30 | 21 |

| I    | Language | 11UGT510005 | General Tamil-V/Hindi-V/French-V | 4   | 3      |
|      | English | 11UGE520105 | General English V | 5   | 3      |
|      | Major-Core | 11UBO530210 | Cell and Molecular Biology | 5   | 3      |
|      | Major-Core | 11UBO530211 | Practical IV: Cell & Molecular Biology, Genetics, Plant Breeding and Evolution | 3   | 3      |
|      | Major-Core | 11UBO530212 | Cell and Molecular Biology | 5   | 3      |
|      | III Core Elect. | 11UBO530301A | Biostatistics | 4   | 4      |
|      | III Core Elect. | 11UBO530301B | Organic Farming (OR) | 4   | 4      |
|      | III Core Elect. | 11UBO530302A | Biodiversity and Climate Change (OR) | 4   | 4      |
|      | III Core Elect. | 11UBO530302B | Horticulture and Landscaping | 4   | 4      |
|      | A. Core | 11UBO530503 | Genetic Engineering | 4   | (3)    |
|      | IV V. Educ. | 11UFC540601 | Mushroom Culture | 2   | 2      |
| Total for Semester V | 30 | 24 |

| I    | Language | 11UGT610006 | General Tamil-VI/Hindi-VI/French-VI | 4   | 3      |
|      | English | 11UGE620106 | General English VI | 5   | 3      |
|      | Major-Core | 11UBO630214 | Plant Physiology | 5   | 4      |
|      | Major-Core | 11UBO630215 | Practical VII: Plant Physiology | 3   | 3      |
|      | Major-Core | 11UBO630216 | Biotechnology | 5   | 4      |
|      | Major-Core | 11UBO630217 | Practical VIII: Biotechnology and Biochemistry | 3   | 3      |
|      |III Core Elect. | 11UBO630303A | Stem Cell Technology (or) | 4   | 4      |
|      |III Core Elect. | 11UBO630303B | Bioinformatics | 4   | 4      |
|      |III Core Elect. | 11UBO630304A | Immunology (or) | 4   | 4      |
|      |III Core Elect. | 11UBO630304B | Sericulture | 4   | 4      |
|      |III Core Elect. | 11UBO630305A | Biochemistry | 4   | (3)    |
|      |IV V. Educ. | 11UFC640602 | Herbal Technology | 2   | 2      |
| Total for Semester VI | 30 | 23 |

Total credit for all semester Basic 145 + Additional credit 10 = 155

### Additional Information
- Total for Semester I: 29
- Total for Semester II: 21
- Total for Semester III: 21
- Total for Semester IV: 21
- Total for Semester V: 24
- Total for Semester VI: 23

Total credit for all semester: 145
1. சுருக்கமாய் குறிப்பிட்டுக்கொள்ள: துளிப்பு குறிப்பிட்டுக்கொள்ள அவர்களின் நூற்றாண்டுக்கு வரையாகிறது.
2. புதுத்தொன்மறைக்கு, தொன்மறைக்கு, சுருக்கமாய் குறிப்பிட்டுக்கொள்ள துளிப்பு குறிப்பிட்டுக்கொள்ள.
3. சுருக்கமாய் குறிப்பிட்டுக்கொள்ள துளிப்பு குறிப்பிட்டுக்கொள்ள.

பட்டியல்-1

1. பாணியின் சுருக்கமாய் குறிப்பிட்டுக்கொள்ள 
2. பதிவுக்கு சுருக்கமாய் குறிப்பிட்டுக்கொள்ள
3. புதுத்தொன்மறைக்கு, தொன்மறைக்கு சுருக்கமாய் குறிப்பிட்டுக்கொள்ள 

பட்டியல்-2

1. சுருக்கமாய் குறிப்பிட்டுக்கொள்ள
2. சுருக்கமாய் குறிப்பிட்டு
3. சுருக்கமாய் குறிப்பிட்டு

பட்டியல்-3

1. சுருக்கமாய் குறிப்பிட்டு
2. சுருக்கமாய் குறிப்பிட்டு
GENERAL ENGLISH – I

Objectives:
1. To enable the students to develop their effective communicative skills in English.
2. To empower the students with fluency and accuracy in the use of English Language.
3. To transform them into globally employable persons with placement skills.

UNIT-I  12 Hrs
Prose Education.
Employment.
Unemployment.
Poem William Shakespeare—“All the World’s a Stage.”
Letter Writing Formal and Informal.
Short Story O Henry – Robe of Peace. (Extensive Reading).
Essential English Grammar – 1-6 units

UNIT-II  12 Hrs
Prose Application.
Planning.
Curriculum Vitae.
Poem Ben Jonson—“On Shakespeare”
Reading Comprehension
Short Story Rudyard Kipling—The Miracle of Puran Bhagat
(Extensive Reading).
Essential English Grammar – 7-12 units

UNIT-III  11 Hrs
Prose Interview.
Reporting.
General Knowledge.
Poem Robert Herrick—“Gather Ye Rosebuds.”
Note Making
Short Story H.G.Wells—The Truth About Pyecraft (Extensive Reading).
Essential English Grammar – 13-18 units

UNIT-IV  20 Hrs
Prose Review.(Super Toys)
Stress.
No Time.
Poem Oliver Goldsmith—“ The Village Schoolmaster”
Developing story from hints
Short Story John Galsworthy—“Quality” (Extensive Reading).
Essential English Grammar – 19-24 units

UNIT-V  15 Hrs
Prose Killers.
Galloping Growth.
A Short Story.
Poem William Blake—“ From Auguries of Innocence”
Précis Writing
Short Story William Somerset Maugham— Mabel
(Extensive Reading).
Essential English Grammar – 25-30 units

Text Books
Objectives
1. To understand the salient features of Algae and Bryophytes.
2. To study the structure and reproduction of various genera mentioned in the syllabus.

Unit - I Algae
General characteristics of algae. Classification of Algae according to F.E. Fritsch. General characteristics of the various classes as per Fritsch’s system. Cell structure of Prokaryotic Algae (Cyanophycean cell) and Eukaryotic Algae (Chlorophycean cell).

Unit - II

Unit - III
Detailed study of structure and reproduction of the following genera: Oscillatoria, Oedogonium, Caulerpa, Cyclotella, Sargassum and Gracilaria.

Unit - IV Bryophytes
General characteristics of Bryophytes, Classification based on Rothmaler (1951), vegetative reproduction in Bryophytes. Economic importance of bryophytes. Evolution of gametophytes and sporophytes in Bryophytes.

Unit V
Detailed study of the following genera: Marchantia, Anthoceros and Funaria.

Text Book

Reference
Semester - I
Hours/week : 5
Credits : 4

11UBO130202

Fungi, Plant Pathology and Lichens

Objectives
1. To understand the general characteristics of Fungi and Lichens.
2. To study the etiology and control of various plant diseases.

Unit - I Fungi

Unit - II
Detailed study of morphology and reproduction of the following genera: Plasmodiophora, Albugo, Peziza, Puccinia and Cercospora.

Unit - III Plant Pathology
Classification of diseases – general symptoms and method of control of plant diseases mechanical, chemical and biological methods. Defence mechanism in plant.

Unit - IV
Detailed study of the following diseases-Mosaic disease of tobacco, Citrus canker, Late blight of Potato, Paddy blast, Red rot of Sugarcane, Bunchy top of Banana, Little leaf of Brinjal.

Unit - V Lichens
Occurrence, distribution, classification, reproduction and economic importance of Lichens. Detailed study of Usnea.

Text Book(s):

Reference
PRACTICAL-I
(Algae, Fungi, Bryophytes, Plant Pathology and Lichens)

Detailed study of the types mentioned in the theory

Algae

- Oscillatoria, Oedogonium, Caulerpa, Cyclotella, Sargassum and Gracilaria.

Bryophytes

- Marchantia, Anthoceros and Funaria.

Fungi

- Plasmodiophora, Albugo, Peziza, Puccinia and Cercospora.

Plant Pathology

- Tobacco Mosaic Virus, Citrus canker, Late blight of Potato, Red rot of Sugarcane, Bunchy Top of Banana, Little leaf of Brinjal, Paddy blast

Lichen

- Usnea

Visit to mushroom culture farm / study of campus flora (Algae & Fungi).
Objectives
1. To understand the animal organization, their structure and function
2. To understand the various physiological processes in human beings

Unit - I
Basic principles of Zoological Taxonomy and Nomenclature. General classification of the animal kingdom up to phylum with examples. Salient features of all phyla with examples. General features of the subphyla: Urochordata, Cephalochordata, Hemichordata and Vertebrata (Classes: Pisces, Amphibia, Reptilia, Aves and Mammalia)

Unit - II
A detailed Type study of Aurelia aurita, Lampito marutii, Asterias rubens and Rana hexadactyla – morphology, all systems and life history. General topics – Human diseases caused by protozoans; Canal system of sponges; larval forms of echinoderms.

Unit - III
Principles of human physiology
Digestion: Physiology of Digestion, Absorption and Excretion of food – Accessory glands and their role. Respiration: Transport of Oxygen and Carbon dioxide, cellular oxidation, respiratory quotient, oxygen debt. Excretion: Structure of a nephron, Physiology of urine formation, physical characteristics and chemical composition of urine.

Unit - IV

Text Book(s):

Reference

Unit - V

Visit to a vermicompost farm and submission of report.
Syllabus : 2011

Syllabus - II

B.Sc. Botany

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GENERAL ENGLISH –II

Objectives:
1. To enable the students to develop their effective communicative skills in English.
2. To empower the students with fluency and accuracy in the use of English Language.
3. To transform them into globally employable persons with placement skills.

UNIT-I 12 Hrs
Prose  Environment.
       A Dead Planet.
       Riddles.
Poem  William Wordsworth—Nutting.
       Shelley- Ozymandias.
       Filling Money Order Chalan and Bank Chalan
Short Story  G.K.Chesterton – The Hammer of God (Extensive Reading)
Essential English Grammar: -31-36 Units

UNIT-II 12 Hrs
Prose  Qahwah
       A Dilemma
       Computeracy
Poetry  John Keats—La Belle Dame Sans Merci
       Robert Browning- The Last Ride Together
Short Story  Katherine Mansfield—A Cup of Tea (Extensive Reading)
Dialogue Writing
Essential English Grammar: 37-42 Units

UNIT-III 11 Hrs
Prose  Review (Use Your English)
       Entertainment
       You and Your English
Poetry  Walt Whitman- I Celebrate Myself.
       Mathew Arnold—Dover Beach.

UNIT-IV 20 Hrs
Prose  War Minus Shooting .
       Usage and Abusage.
Poetry  Sarojini Naidu—The Gift of India..
       Robert Frost—Design .
Short Story  R.K. Narayan—Half a Rupee Worth (Extensive Reading)
            Manohar Malgonkar—Bacha Lieutenant
Story Telling
Essential English Grammar: 49-54 Units

UNIT-V 15 Hrs
Prose  Who’s Who.
Poetry  Nissim Ezekiel. The Night of The Scorpion
Short Story  Anita Desai—A Devoted Son (Extensive Reading)
            Ruskin Bond—The Boy Who Broke the Bank (Extensive Reading)
            Report Writing
Letter to the Editor
Essential English Grammar: 55-60 Units

Text Books
PTERIDOPHYTES, GYMNNOSPERMS AND PALEOBOTANY

Objectives
1. To study the salient features of plants belonging to Pteridophytes and Gymnosperms.
2. To study the fossilization process and formation of different types of fossils.

Unit - I Pteridophytes
General characteristics, Classification (Reimer’s System, 1954). General characteristics of major divisions, Psilophyta, Lycophyta, Sphenophyta and Pterophyta. Stelar evolution, homospory, heterospory seed habit and economic importance.

Unit - II
A detailed study of the morphology anatomy and following genera – Lycopodium, Selaginella, Equisetum, Adiantum and Marsilea.

Unit - III Gymnosperms
General characteristics, distribution, classification (Sporne, K.R). Vegetative, anatomical and reproductive characteristics of major divisions, Cycadophyta, Coniferophyta and Gnetophyta. Salient features of Pteridospermales, Bennettitales, Cycadales, Cordaitales, Coniferales and Gnetales.

Unit - IV
A detailed study of the following genera: Cycas, Araucaria and Gnetum (developmental details not required).

Unit - V Paleobotany

Textbook(s):

Reference
PRACTICAL - II
(Pteridophytes, Gymnosperms, Anatomy and Embryology)

Detailed study of the types mentioned in the theory.

Pteridophytes
Lycopodium, Selaginella, Equisetum (no dissection), Adiantum and Marsilea.

Gymnosperms
Cycas, Araucaria and Gnetum.

Fossils
Rhynia, Lepidodendron, Calamites, Lyginopteris and Medullosa.

Anatomy
Anomalous secondary thickening in Aristolochia, Bignonia, Boerhaavia, Thunbergia and Dracaena.
Nodal anatomy.
Preparation of keys to identify any five important timbers of South India on the basis of anatomical characters.

Embryology
TS of young and mature anther, ovule, endosperm types and dissection and isolation of developmental stages of embryos.
Syllabus: 2011

Semester – II

ALLIED: ZOOLOGY-II

Hours/week : 4
Credits : 3

Objectives
1. To study the classification of insects
2. To study beneficial and harmful insects and various control measures of harmful insects

Unit – I
Insect morphology: head, external structure, tentorium, compound eye, types of antennae - thorax- tergum, sternum, pleuron. Wing structure and coupling mechanism, wing venation, Legs and their modification, Abdomen- abdominal appendages, Male and female external genitalia.

Unit – II
Physiology of digestive, respiratory, circulatory, nervous and reproductive systems, Immature stages of insects-metamorphosis – types-hormonal regulation.

Unit – III
Economically important insect orders – Coleoptera, Dictyoptera, Diptea, Hemiptera, Hymenoptera, Isoptera and Lepidoptera, - general characters and classification upto order, social behavior/life of insects.

Unit – IV

Unit – V
Pests of stored food materials (Sitophilus oryzae, Rhizopertha dominica, Tribolium castaneum, Sitotroga cerealella, Oryzaephilus surinensis, Trogoderma granarium) and their control, Study of Bionomics and control of pests of Paddy (Tryporyza incertulas, Chilo polycharya, Spodoptera mauritia), Sugarcane (Chilo infuscatusellus, C. sacchariphagas, T. rivella), Cotton (Aphis gossypii, Amarasca biguttula, Thrips tabaci, Earis insulana, Platypedra gossypiella) and Coconut (Orycytes rhinoceros, Rhycholophorus ferrugineus, Nephanthis serinopa)

Text Book(s):

Reference
ALLIED: PRACTICAL-II
(Zoology – II)

- Study of distinguishing features of insects studied in theory and making sketches.
- Collection, identification and preservation of insects of agricultural importance, predators, pollinators, and weed killers – plant galls.
- Study of different categories of insect pests and types of damage done by them in the field, godowns and warehouses.
- Dissection of Cockroach to study the mouthparts, digestive, nervous and reproductive systems, Salivary gland, Haemocytes.
- Modification of Antenna, legs, mouth parts.
- Light trap collection and identification.
- Visit to a sericulture center and submission of report.
ANATOMY AND EMBRYOLOGY

Additional Core

Objectives
1. To impart knowledge about the various components and characters of wood.
2. To study the basic principles of embryo.

Unit - I

Unit – II

Unit - III

Unit - IV
Microsporangium, Microsporogenesis - Development of male gametophyte. Megasporangium, Megasporogenesis. Development of female gametophyte - Monosporic (Polygonum), bisporic (Allium), tetrasporic (Peperomia)

Unit - V

Text Book(s):

Reference
Syllabus : 2011

B.Sc. Botany

1. நீர்கருங்கார்கள் (நீர்வழித்தமிழ் எதிர்ப்பு காட்டும் கொட்டங்கள்) (12 செடிகள்)
2. இன்பகுதிகள், இன்பத்தைத்துறையை இன்றுவைத்துறையை எளிமையாக்குவது (பயிற்சி விளக்கப்படுத்தும் அருங்கட்டுரு)
3. நூற்றாண்டுப் பொறியியல் மற்றும் நூற்றாண்டுப் பொறியியல் விளக்கும் காலங்கள் (தொகுப்பு, குப்பேசிக்).

மேற்கோள் பொருள்

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<tr>
<th>பொருள்</th>
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GENERAL ENGLISH -III

Objectives:
1. To enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons.
2. To enable the students to complete the post-reading task centering on Grammar and Skill Development
3. To empower the students with globally employable skills.

UNIT-I 12 Hrs
Larry Collins & Dominque Lapierre
Freedom at Midnight (Extract)
Alfred Uhry
Driving Miss Daisy
Extensive Reading—Robinson Crusoe (Chapters 1-3)

UNIT-II 12 Hrs
Alfred Lord Tennyson
Ulysses
Nathanial Branden
Our Urgent Need for Self-esteem
Extensive Reading—Robinson Crusoe (Chapters 4-6)
Essential English Grammar—67-72.
Reader’s Mail :The Hindu

UNIT-III 11 Hrs
Daniel Goleman
Emotional Intelligence
Marcel Junod
The First Atom Bomb.
Extensive Reading—Robinson Crusoe (Chapters 7-9)
Essential English Grammar—73-78.
Job Application.

UNIT-IV 20 Hrs
E.K.Federov
Climate Change and Human Strategy.
Paolo Mauro
Corruption: Cases, Consequences and Agenda for further Research.
Extensive Reading—Robinson Crusoe (Chapters 10-12)
Essential English Grammar—79-84.
Minutes Writing.

UNIT-V 15 Hrs
Anne Frank
The Diary of Young Girl
A.P.J.Abdul Kalam
Wings of Fire
Extensive Reading—Robinson Crusoe (Chapters 13-15)
Resume Writing.

Text Books
Syllabus : 2011

Semester - III
11UBO330206

Credits : 4

TAXONOMY OF ANGIOSPERMS

Objectives
1. To observe the variations among plants, especially angiosperms.
2. To understand the way of description of a plant.
3. To study the floral characters with an aim to identify the taxa authentically.

Unit - I

Unit - II

Unit - III
Detailed study of the range of characters and plants of economic importance in the following families: Dicotyledons: Annonaceae, Cruciferae, Tiliaceae, Rutaceae, Anacardiaceae, Rosaceae, Caesalpiniaeae, Myrtaceae, Lythraceae.

Unit - IV
Cucurbitaceae, Apiaceae, Rubiaceae, Compositae, Sapotaceae, Apocynaceae, Asclepiadaceae, Solanaceae, Bignonaceae.

Unit - V

Text Book(s):

Reference
Semester - III  
11UBO330207

PRACTICAL-III  
(Taxonomy of Angiosperms)

1. Description of plant in technical terms.
2. A detailed study of the range of vegetative and floral characters of plants belonging to the families mentioned in the theory part (Except Orchid acae).
3. Field trip to any place within or outside the state to study the plants in their natural habits.
4. Spot identification (Binomial, Family) of plants from families included in the theoretical syllabus.
5. Field note-book and five herbarium sheets of common angiosperms are to be prepared and submitted at the time of Practical Examination.

Semester - III

The students are required to take any one of the following allied courses in his choice.  
(The Botany Students can take any one of the following allied courses for their course of study)

08UBO330405 A  ALLIED: CHEMISTRY FOR BIOLOGIST – I  
08UBO330405B  ALLIED: BIOMETRICS AND COMPUTER APPLICATIONS – I  

(OR)

08UBO330406A  ALLIED: CHEMISTRY FOR BIOLOGIST – I (PRACTICAL)  
08UBO330406B  ALLIED: COMPUTER LAB – I (EXCEL)
Allied: CHEMISTRY FOR BIOLOGISTS-I

Objectives
1. To understand the various chemical principles involved in Biological processes.
2. To apply the various concepts of chemistry in Applied Biology.

Unit - I Inorganic Chemistry

Unit - II Organic Chemistry

Unit - III Quantitative Analysis
Error Analysis: accuracy, precision, errors, determinate and indeterminate errors, eliminating and minimizing error, relative error, absolute error. Quantitative Analysis: titrometry, gravimetry, colorimetry. Titrimetric analysis: acid-base, redox, complexometric, precipitation. And example each with indicators used. Concentration units: mole, molarity, molality, normality, ppb, ppm, mole fraction, %W/V, V/V. Acid-base titration: primary standard, secondary standard, $V_1N_1 = V_2N_2$, acid-base titration, indicators in the illustration.

Unit - IV Agricultural Chemistry
Soil types-red soil, black soil, alluvial soil, desert soil, red soil; role of humus: Manures and their importance. Chemical fertilizers: Natural and synthetic fertilizers: NPK fertilizers: manufacture of NPK fertilizers, mixed fertilizers; role of macronutrients and micronutrients: Pesticides: classification-insecticides, herbicides and fungicides; Structure of important pesticides: DDT, BHC, 2,4-D, 2,4,5-T; biomass and sits utilization; triple revolution India (Green, Blue and White).

Unit - V Bioinorganic Chemistry

Text Book(s):

Reference
Semester - III
11UBO330405B

Allied: BIOMETRICS AND COMPUTER APPLICATIONS – I

Objectives
1. To learn the basics of statistics in Biological context.
2. To apply the statistical principles in designing Biological experiments and solving biological problems.

Unit - I:
Types of measurements – (Interval, ratio, rank order, categorical) logarithm, permutation and combination.

Unit - II:
Solving a simple linear equation involving one variable and two variables. Matrices - operation on matrices – Determinants – Inverse – Solving a system of equations of order 3xd3 using Cramer’s rule, inverse method – Gauss Elimination method.

Unit - III:
Mathematical modeling: The simple function and their graphs revisited – principle of least squares (concepts only) – normal equations for curves, straight line, parabola – power curves, exponential curves, y = a + bx, y = ax^2 + bx + c, y = ae^x – Solving the above system of equation.

Unit - IV:

Unit - V:

Text Book(s):

Reference:

Semester - III
08UBO330406B

ALLIED: COMPUTER LAB – I
(EXCEL)

Using the Excel packages the students are asked to solve the following exercises.
1. Solving a system of equations – Inverse Matrix, Cramer’s rule.
2. Curve fitting – Straight line, Regression line and second degree.
3. Construction of frequency table – Univariate, Bivariate and Cross tabs.
4. Drawing frequency graphs.
5. Pictorial presentation – Bar diagrams, Pie diagrams etc.
11UGT410004

Syllabus : 2011

B.Sc. Botany

1. குளம்பூதை, முதல் விவகாரத்தின் முழுப்பையுற்றுக்கோள் (புக்கா),
   உடம் அல்லது எடுக்கும். (புக்கா - 3 தோடு)

2. முதல் விவகாரத்தின் முழுப்பையுற்றுக்கோள் - என்று விலகிப் போக்கு எடுக்கிறோம்,
   அல்லது விளக்காக, கால்வழியில் என்னவோ. கூற்று - 613 006.

பல்குறியாளர்

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மாணிக்காளர்

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   உடம் அல்லது எடுக்கும். (புக்கா - 3 தோடு)

2. முதல் விவகாரத்தின் முழுப்பையுற்றுக்கோள் - என்று விலகிப் போக்கு எடுக்கிறோம்,
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மாணிக்காளர்
GENERAL ENGLISH -IV

Objectives:
1. To enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons.
2. To enable the students to complete the post-reading task centering on Skill Development and Grammar.
3. To empower the students with globally employable soft skills.

UNIT-I 12 Hrs
Life Stories
F.G.Herod
Mother Teresa
R.K.Narayan
Swami and Friends
Extensive Reading
Treasure Island (1-4)
Essential English Grammar 91—95.
Film Review (The Hindu).

UNIT –II 12 Hrs
Imogen Grosberg
See Off the Shine
George Orwell
The Porting Spirit
Extensive Reading
Treasure Island (5-8)
Essential English Grammar 96-100.
Article Writing on Current Issues.

UNIT-III 11 Hrs
Philip Agre
Building an Internet Culture
Satyajit Ray
Odds Against Us
Extensive Reading
Treasure Island (9-12)
Essential English Grammar 101-105.
Mock Interviews

UNIT-IV 20Hrs
Jerzy Kosinski
TV as Babysitter.
E.F.Scumacher
Technology With Human Face.
Extensive Reading
Treasure Island (13-17)
Essential English Grammar 106-110.
Mock Group Dynamics

UNIT-V 15 Hrs
Aluizio Borem, Fabrico
R.Santos & David E.Bower
Advent of Biology
Mark Ratner & Daniel Ratner
Nanotechnology
Extensive Reading
Treasure Island (18-22)
Essential English Grammar 111-114.
Presentation Skills

Text Books
Syllabus: 2011

Semester - IV
11UBO430208

CREDITS: 4

OBJECTIVES
1. To study basic molecular mechanism in organisms
2. To understand how the gene unravels conferring the traits on the organism.

Unit - I
Cell cycle; cellular mechanisms in development and differentiation; Cytoplasmic organelles: membrane structure, organization and functions of nucleus, mitochondria, chloroplasts, ER, ribosomes, golgi complex, lysosome, vacuole and cytoskeleton.

Unit - II
DNA replication: Semi conservative model, mechanism of replication in Prokaryotes; replication of RNA genome – replicase and reverse transcriptase. Mutation: Types of mutations. Physical and chemical mutagens. DNA repair mechanisms - mismatch and proof reading, photoreactivation, excision, recombination and SOS mechanisms in E. coli

Unit - III
Gene expression and the Central Dogma, transcription: RNA polymerase, signals, chemistry of RNA synthesis, mechanism of initiation, elongation and termination in E. coli. Differences in eukaryotes, post-transcriptional processing, spliceosomes.

Unit – IV

Unit - V

Text Book(s):

Reference
Semester - IV
11UBO430209
Credits : 3

PRACTICAL-IV
(Cell & Molecular Biology and Genetics, Plant Breeding and Evolution)

Practical
1. Ultra structure of cell organelles.
2. Study of mitosis in root tips
3. Study of meiosis in Anthers
4. Inheritance Pattern
5. Linkage Mapping.
6. Estimation of allele frequency in natural (random matting) populations.
7. Isolation of nuclear DNA from onion.
8. Extraction of human genomic DNA from saliva.
9. Isolation and display of polytene chromosomes.
11. Emasculation
12. Techniques in breeding-layering, grafting, bagging.

Semester - IV

The Student is required to select the optional in concordance with the one selected in the semester III.

08UBO430407 A  ALLIED : CHEMISTRY FOR BIOLOGIST – II
08UBO430407 B  ALLIED : BIOMETRICS AND COMPUTER APPLICATIONS – II

(OR)

08UBO430408 A  ALLIED : PRACTICAL-II (CHEMISTRY)
08UBO430408 B  ALLIED : COMPUTER LAB – II (Statistical Software Package)
Semester - IV
11UB0430406A
Allied: CHEMISTRY FOR BIOLOGISTS II

Objectives
1. To understand the chemistry of plant components and products so as to exploit chemistry in the improvement and production of phytochemicals.
2. To import knowledge in some basic techniques necessary to handle the above objective.

Unit - I Physical Chemistry
Thermodynamics of a chemical reaction - Terms $\Delta E$, $\Delta H$, $\Delta S$, $\Delta G$, endothermic, exothermic reactions, conditions for spontaneity of reactions. Calorific value of food substances. Chemical kinetics - rate, order, molecularity of reactions. Importance of kinetic study, activation energy, activated complex, factors affecting rate of the reactions, the order of biological reactions.

Catalysis – act of catalysis, kinetics of enzyme catalysis, Michaelis – Menten constant, active sites, turn over number, factors affecting enzyme catalysis-concentration of substrate, temperature, pH and inhibitors.

Unit - II Pharmaceutical Chemistry

Unit - III Chemistry of Natural Products
Structural Elucidation of the functional groups in natural products by chemical methods (-OCH$_3$, -OH, -COOH, -COOR, oxidation, reduction). Alkaloids: Classification, occurrence: structure, physical properties and uses of papaverine, nicotine, coniine, Terpenes: Classification, isolation, structure, properties and uses of camphor, citral and $\alpha$-pinene. Importance and uses of anthocyanins, flavones and flavonoids.

Unit - IV Organic Analysis
Qualitative analysis of organic substances: test for saturation and unsaturation; aliphatic & aromatic; acidic, basic and neutral nature; elements test for N, S and halogens: functional groups like acid, phenol, aldehyde, ketone, carbohydrate, amine, ester, amide and diamide.

Unit - V Chromatography

Text Book(s):

Reference
Semester - III & IV

Allied: PRACTICAL CHEMISTRY FOR BIOLOGISTS II

I Volumetric Analysis

1. Estimation of HCl (Std. oxalic acid x NaOH x HCl)
2. Estimation of NaOH (Std. NaCo3 x HCl x NaOH)
3. Estimation of oxalic acid (Std. FAS x KMnO4 x oxalic acid)
4. Estimation of FAS (Std. oxalic acid x KMnO4 x FAS)
5. Estimation of KMnO4 (Std. K2Cr2O7 x FAS x KMnO4)
6. Estimation of ascorbic acid (iodimetry)
7. Estimation of phenol / aniline (iodimetry)
8. Estimation of copper (iodimetry)
9. Estimation of zinc (edta titration)
10. Estimation of magnesium (edta titration)
11. Estimation of hardness of water (edta titration)

II Organic Analysis

a) Identification of acidic, basic, phenolic and neutral organic substances.
b) Test for aliphatic and aromatic nature
c) Test for saturation and unsaturation.
d) Detection of N, S and halogens.
e) Identification of functional groups.
i. Carboxylic acid (mono-, di-& unsaturated)
ii. Phenol
iii. Aldehyde
iv. Ketone
v. Ester
vi. Carbohydrates
vii. Primary amine
viii. Amide (mono-&di-)

References

Allied: BIOMETRICS AND COMPUTER APPLICATIONS – II

Objectives
1. To understand the various applications of statistics with reference to biological sciences.
2. To enable the students to handle and analyse biological data.

Unit - I
Correlation and Regression: Correlation: Types of correlation – scatter diagram – Pearson’s coefficient of correlation – Rank correlation.
Simple Regression: Meaning of regression lines – Regression equations Y on X and X on Y only – Regression Coefficient – Simple problems.

Unit - II

Unit - III

Unit - IV

Unit - V
Comparison between Parametric and Non-parametric tests. Non-parametric tests – Single test, Run test for randomness, Wald-Wolfowitz run test, Median test, Wilcoxon single rank test, Mann Whitney U test – (no derivations – conceptual and applications understanding are to be tested).

Text Book(s):
Nageswara Rao G. Statistics for Agricultural Science OXFORD & IBH publishing Co.

Reference
Semester - IV
11UBO430502

GENETICS, PLANT BREEDING AND EVOLUTION
(Additional Core)

OBJECTIVES
1. To study the progress made in the field of cell, cell organelles and their functions.
2. To understand the principle, the hereditary mechanism, the structure and functions of genetic materials.

Unit - I
Mendel’s laws of heredity, gene interaction and chromosome basis of heredity. Modified Mendelian ratios. Multiple alleles, linkage and crossing over; Sex linked inheritance, sex determination mechanism. Cytoplasmic inheritance and plastid inheritance.

Unit - II
DNA is the genetic material: proof: Griffith’s, Avery et al., and Hershy and Chase. RNA as genetic material. Structure of DNA and RNA. Nucleosides and nucleotides, polynucleotide chain. Primary, secondary and tertiary structures. Chromatin nucleosomes and chromosomal proteins, protamines and histones, organization of genomes-eukaryotic and prokaryotic. Special types – polytene & Lamp brush.

Unit - III

Unit – IV

Unit – V

Text Book(s):

Reference
Semester - V
11UBO530210

BIOPHYSICS AND BIOSTATISTICS

Biophysics

Unit – I


Unit – II


Biostatistics

Unit - III

Introduction - Definition – Data: Primary& Secondary; Observational & Experimental; Probabilistic & Deterministic; Variable: discrete & continuous – Population & Sample; Random sample. Sampling technique - Judgment Sampling, Random Sampling by Lottery and Random number table methods, stratified random (proportionate and disproportionate) Sampling; Systematic random sampling; Multistage Random Sampling merits and demerits of the above methods. Classification - Frequency Distribution: Discrete, Continuous and Cumulative Frequency Distributions – Parts of a statistical Table – Advantages of classification of Data. Presentation of Data - Histogram, Frequency polygon, Frequency curve, Ogive curve, Bar Charts: Simple, Multiple, Subdivided, percentage – Pie diagram.

Unit – IV


Unit – V

Probability - Definition – Binomial, Poison and Normal distributions.

Tests of Significance

General procedure – Large sample testing & Small sample testing: t- Test, Chi-square test and F test.

Text Book(s):

Reference
Semester - V
11UBO530211

Practical – V

BIOPHYSICS AND BIOSTATISTICS

Biophysics

1. Colorimetry to illustrate Beer – Lambert Law
2. Preparation of Reference Curves for amino acids, Glucose and BSA
3. Determination of osmotic potential of potato tuber
4. Separation of cell and tissue components by centrifugation
5. Separation of pigments by Paper and Column chromatography
6. Acid – Base Titration and determination of pKa and preparation of buffers
7. Absorption spectrum of macromolecules and pigments

Biostatistics

1. Sampling Technique using Random Number Table Method.
2. Data collection from a sample of 50 cluster bean Seeds for Discrete and pod length for continuous data
3. Frequency Distribution: Discrete, continuous and cumulative
4. Statistical Diagrams Histogram, Frequency curve, bar charts and ogive curve
5. Calculation Mean, Median, and mode for the ungrouped and grouped data obtained in the Experiment number 10
Syllabus: 2011

Semester - V

11UBO530212

Hours/week : 5
Credits : 4

MICROBIOLOGY

OBJECTIVES
1. To study the different types of micro-organisms and their activities.
2. To understand and exploit their potentialities in agriculture, industry and other environmental aspects.

Unit - I

History and scope of microbiology, characterization and classification of microorganisms. – Whittaker’s five kingdom concept – Bergey’s manual of systematic bacteriology – outline only. Morphology, cell structure, cell wall chemistry, growth, nutrition and reproduction of bacteria. Viruses – structure, classification and multiplication. A general account on Rickettsias, Chlamydias and Mycoplasmas.

Unit - II

Culture of microorganisms: Pure cultures, batch and continuous cultures. Preservation of microorganisms. Microorganisms and Human diseases. Food borne (Botulism and Gastroenteritis), water borne (Typhoid & Cholera) Air borne (Small pox and Tuberculosis), vector borne (Plague and malaria) and contact diseases (Mycoses and Candidiasis). Control of microorganisms – physical, chemical and biological methods.

Unit - III


Unit - IV

Industrial microbiology – role of microbes in various industries - Fermentors and fermentation technology. – large scale production of ethanol, single cell protein, lactic acid, glutamic acid, amylase, penicillin, insulin, vaccines and interferons.

Unit - V

Role of microbes in agriculture – microbes in nitrogen fixation and phosphate solubilization – Biofertilizers – algal (BGA), bacterial (Azospirillum, Rhizobium) and mycorrhizal (AMF). Biopesticides - their types and applications – Bacillus thuringiensis and Baculoviruses. Microbes and biogas production – sewage treatment – primary, secondary and tertiary treatments. Biodegradation of cellulose, lignin, petroleum wastes and heavy metals.

Text Book(s):

Reference
PRACTICALS - VI
(Microbiology & Genetic Engineering)

Microbiology
1. Preparation of common media (Nutrient agar & Potato dextrose agar).
2. Staining of Bacteria (Simple & Grams staining).
3. Isolation and enumeration of microbes in soil and water.
4. Study of motility by Hanging Drop.
5. Pure cultures of bacteria – Streak plate, Pour plate and Spread plate.
6. Microbiology of milk (Qualitative and Quantitative tests).
7. Antibiosis.
8. Isolation and identification of Azospirillum, Rhizobium

Genetic Engineering
1. Isolation of genomic DNA from plant tissue (cauliflower) using potassium acetate method.
2. CTAB extraction of DNA from plant tissue (Ipomoea leaves)
3. Isolation of genomic DNA from animal tissue by SSI methods.
4. SDS-PAGE (demonstration only)

Visit to TNAU or Dairy farm and submission of report.
BIOPESTICIDES
(Core Elective)

OBJECTIVES
1. To know the principles, types and mode of action of Biopesticides.
2. To develop skill in crop protection using environmentally safe technology.

Unit - I

Unit - II
Botanical pesticides: Present status and future prospects; opportunities for botanical pesticides in crop rotation; multiple cropping for controlling pests. Plants as a source of natural pesticides: Mustard, Chrysanthemum, Pepper, Garlic, Turmeric and Citronella as biopesticides.

Unit - III
Biocontrol agents: Isolation, identification, mode of action and mass production of Pseudomonas fluorescens (bacterial agent), Trichoderma viride (fungal agent); application against seed borne and soil borne diseases.

Unit - IV
Biological Pesticides: Isolation, identification, Bacterium as biopesticide: Bacillus thuringiensis: Fungus as biopesticide (entomophagous): Beauveria bassiana and Trichoderma. Insect as biopesticide: Trichogramma. Virus as biopesticide: Baculovirus-NPV.

Unit - V
Production methods of biopesticides: Liquid culture fermentation and solid state fermentation – Types of biopesticide formulations; Dry inoculum, Granules, Pellets, Capsules, Wettable powder and Liquid formulations. Genetic engineering and pest resistant plants (outline only)

Text Book(s):

Reference
1. Krishna Chandra, Greep & Srivathsa, 2005, Bio Control Agents & Biopesticides,
Semester - V

11UBOS530301B

ORGANIC FARMING
(Core Elective)

OBJECTIVES
1. To discuss on the impact of products of chemical based agriculture.
2. To discuss on the importance of sustainable agriculture.

Unit - I

Soil – physical, chemical properties. Soil pollution – oil, chemicals – fertilizers, pesticide and herbicide, – non-degradable solids, biomagnification, consequences of land pollution – damage to soil and crops, heavy metal contamination.

Unit - II


Unit - III


Unit - IV


Unit - V


Text Book(s):

Reference

Online Resources
http://attra.ncat.org/organic.html#list
http://www.epa.gov/agriculture/tbio.html
Objectives: To understand the emerging trends of low-carbon economy; and to elucidate the strategies of protecting the bioresources.

Unit – I Biodiversity
- Types – Genetic, species and ecosystem diversity; global biodiversity.

Unit – II Conservation

Unit – III Climate change

Unit – IV
- CO₂ capture and storage methods: Geological storage, Ocean storage, Mineral storage & Leakage. CO₂ reuse mechanisms - single step methods: CO₂ → methanol, CO₂ → hydrocarbons and CO₂ → CO → hydrocarbons. CCS projects.

Unit - V

Text Book(s):
3. The World Conservation Strategy. IUCN, Switzerland.
Semester - V
11UBO530302B

HORTICULTURE AND LANDSCAPING
(Core Elective)

Objectives
1. This course is designed to provide theoretical knowledge about the gardening to enable them to be self reliant knowledge and self employment.

UNIT- I
Introduction – scope and division of Horticulture, History of Gardening-some famous gardens in India, Types of Garden-Indoor garden, public garden, kitchen garden. Garden implements and accessories

UNIT- II

UNIT- III
Garden operations-planting and transplantation, pinching, disbudding, defoliation, staking, pruning watering, mulching, topiary.

UNIT- IV
Terrace garden, rock garden, hydroponics, terrarium, arches, pergolas, Bonsai and lawn.

UNIT- V
Cut flowers, Flowers arrangements, commercial floriculture, cultural practices of rose, jasmine, chrysanthemum and orchids.

Text Book(s):

Reference
GENETIC ENGINEERING
(Additional Core)

OBJECTIVES
1. To understand the basic mechanism involved in the production of transgenic microbes, plants and animals
2. To know the role of advanced techniques such as PCR, RFLP and RAPD in molecular biology.

Unit - I

Unit - II

Unit - III
Enzymes used in genetic engineering: restriction enzymes; DNA modifying enzymes; and enzymes used in cloning. Gene cloning strategies: cDNA library and Genomic library.

Unit - IV
Methods of gene transfer to animals, plants and bacteria: Microinjection, Ca-transfection, electroporation, shotgun, lipofection, somatic cell nuclear transfer (SCNT), embryonic stem cells.

Unit - V
Principles and applications of molecular techniques: DNA sequencing strategies, gene mapping and nucleic acid hybridization techniques (Southern, Northern, Western, Southwestern blotting) – DNA fingerprinting, PCR, RFLP, RAPD and microarrays.

Text Book(s):

Reference
MUSHROOM CULTURE
(Skill base Elective)

Objectives
1. To facilitate self-employment.
2. To know the nutrient value of mushroom.

Unit - I
Introduction – Classification — Tests for identification — Nutritive value of mushrooms.

Unit - II
Characteristics of common edible mushrooms a) Paddy straw, b) Button, c) Oyster d) Milky mushrooms. Life cycle of a common mushroom (Agaricus).

Unit - III
Culture Techniques – Preparation of spawn, preparation of compost – Spawn running – Harvesting marketing.

Unit - IV
Preservation and storage of mushrooms – Diseases and pests of mushrooms.

Unit - V
Delicious recipes of mushroom – Economic importance of mushrooms.

Text Book(s):
Nita Bahl, Handbook on Mushrooms, S.Chand & Co. Ltd.

Reference
Dubey, RC. A text book of biotechnology, S.Chand & Co. Ltd.
Syllabus: 2011
Semester – VI
11UBO630214

Credits : 4

PLANT PHYSIOLOGY

Objectives
1. To learn the underlying principles of the various physiological processes of plants
2. To study the various physicochemical and morphogenetic processes taking place during the various stages of plant growth

Unit - I

Unit - II

Unit - III

Unit - IV

Unit - V
Growth: Stages of Growth – Plant Growth Substances: Discovery, Bioassay, Mode of Action and physiological effects of Auxins, Gibberellins, Cytokinins, Ethylene and Abscisic acid – Irritability and Plant Movements – Dormancy: Seed and bud - Causes of Seed Dormancy, Breaking of seed dormancy, Significance of Seed Dormancy – Physiology of seed germination – Photoperiodism, Vernalization and Flowering – Plant rhythm and Biological Clock

Text Book(s):

Reference
PRACTICAL - VII  
(Plant Physiology) 

1. Effect of temperature on membrane permeability. 
2. Osmosis – Thistle funnel, potato osmoscope. 
3. Determination of water potential and solute potential. 
4. Determination of root pressure and sap exudation. 
5. Lifting power of transpiration. 
7. Extraction and separation of leaf pigments. 
8. Effect of light and CO$_2$ on photosynthesis. 
9. Aerobic respiration and fermentation. 
11. Demonstration experiment 
   i. Phototropism, 
   ii. Geotropism, 
   iii. Arc Auxanometer 
   iv. Dialatometer 
   v. Hydrophonics
BIOTECHNOLOGY

OBJECTIVES
1. To study the emerging trends in biotechnology such as gene therapy, DNA finger printing and molecular cloning
2. To enumerate the role of 21st century science, biotechnology in increasing productivity of crop plants, to enhance the production of high value metabolites.

Unit - I

Unit - II
Production of Transgenic plants for tolerance against herbicide, insects, drought and salinity. Genetic Use Restriction Technology (GURT); Challenges and applications.

Unit - III
Anti-sense RNA technology and the flavr savr tomato. Post Transcriptional gene silencing (RNA interference), Plantibodies. Monoclonal antibodies and hybridoma technology; Gene therapy, immunotoxins and recombinant vaccines.

Unit - IV
Cloning – therapeutic and reproductive; Xenografting. Biotechnology in aquaculture ploidy induction, gynogenesis, and androgenesis; production of transgenic fish – the salmons and tilpias.

Unit - V

Text Book(s):

Reference
Semester - VI
11UBO630217

PRACTICAL - VIII
(Biotechnology & Biochemistry)

Biotechnology
1. Culture media and sterilization techniques
2. Generation of In vitro plants
3. Embryo culture
4. Callus induction and differentiation
5. Somatic embryogenesis.
6. Micropropagation and Synthetic seeds

Biochemistry
7. Qualitative estimation of sugars.
8. Estimation of total lipids.
10. Determination of strength of amino acids.
12. Separation of plant pigments by Column chromatography
13. Assay of alkaline phosphatase, peroxidase and amylase

Core Elective: STEM CELL TECHNOLOGY

Objectives
1. To acquaint students of biology with the latest development in biotechnology.
2. To understand the pros and cons of stem cell technology.

Unit - I : Stem cells - definition; unique properties – proliferation and differentiation; Potency definitions: totipotent, pluripotent, multipotent and unipotent; basics of early human embryology; History and key stem cell research events.

Unit - II : Isolation, culture, identification and assays. Types: unlimited and limited; Embryonic and adult stem cells - bone marrow, cord blood, neural, endothelial, hematopoietic, epithelial, pancreatic, hepatic, glandular, cardiac and gastrointestinal.

Unit - III : Stem cells and cloning; germ line stem cells; Recruiting Donors and Banking hES Cells; IPRs and hES Cells.

Unit - IV : Genetically engineered stem cells and experimental therapies. Stem cell based therapies: stem cells and repair of heart and nervous system; regeneration strategies.

Unit - V : Guidelines for hES cell research - Scientific background of hESC research; Ethical and scientific concerns; Current Regulation of Human Embryonic Stem Cell Research. Future of SC research.

Text Book(s):
2. Verma IM and Gage FH 2002 (Ed) Regenerative Medicine, Natl Acad Sci & Engg, USA

Reference
1. The Natl Academies, USA 2007 Understanding Stem Cells
2. The Natl Academies, USA 2002 Stem Cells and the Future of Regenerative Medicine
3. Stem Cells Info 2008, NIH USA
4. Terese Winslow 2006 Regenerative Medicine, Natl Acad Sci & Engg, USA.
OBJECTIVES
1. To know the various databases available.
2. To learn sequence analysis.

Unit - I

Unit – II
Protein sequences databases; primary databases PIR, MIPS, SWISS – PROT, TrEMBL, NRL-3D. Structure of SWISS – PROT entries. Secondary Databases; PROSITE, PROFILES, PRINTS, Pfam, BLOCKS and IDENTITY. Composite protein Databases.

Unit - III
Gene structure and DNA sequences CDS – open reading frames – The EST alphabet – The expression profile of a cell, cDNA libraries and ESTs. EST analysis tools – sequences similarity search tools, sequence assembly tools and sequence clustering tools. Alignment techniques; use of characters. Identity and similarity.

Unit - IV

Text Book(s):

Reference
IMMUNOLOGY

Objectives
1. To understand the basic immune system of the human beings
2. To understand the mechanism of antigen and antibody interaction

Unit - I
Immune system - adaptive, innate, humoral and cellular immunity. Origin, structure and immunological role of primary lymphoid organs (bone marrow, thymus, Bursa of Fabricius) and Secondary lymphoid organs (Spleen, lymph nodes, Payer’s patches, tonsils, appendix).

Unit - II
Origin, structure and immunological role of immune cells (Leucocytes and lymphocytes) Lymph- composition and functions Antibody types - study of Ig G, its structure and immunological role.

Unit - III

Unit - IV
Primary and secondary immune responses. Vaccines – Definition, Types; Vaccinization schedule. Immune response against intracellular pathogens (virus & bacteria) and extra cellular pathogens (bacteria, fungi, protozoans and worms).

Unit - V Basic Immunological Techniques and their applications.

Text Book(s):

Reference
OBJECTIVES
1. To learn the various techniques and procedures to produce optimum herbage yield of mulberry crop.
2. To understand the silkworm rearing technology.

Unit - I

Unit - II

Unit - III
Mulberry Cultivation: Conditions required for mulberry growth – Soil and preparation of land; Selection, Preparation and Layout of plantation – Mulberry varieties – Sexual and Asexual propagation – Nurseries – Leaf harvesting methods and preservation of leaves; Mulberry Diseases (bacterial, viral, fungal and parasitic)

Unit - IV

Unit - V

Text Book(s):

Reference
Semester - VI  
11UBO630504  

BIOCHEMISTRY  
(Additional Core)  

Objectives  
1. To understand the structure and properties of the biomolecules  
2. To know the reactions performed by the biological macromolecules  
3. To understand the role of molecules like vitamins and minerals in the net-working of the biological cell  

Unit - I  
Carbohydrates: Classification, Stereochemistry of simple sugars, $\alpha$ & $\beta$ glycosidic linkages; structure and properties of mono - and disaccharides. Polysaccharides: chemical structure and function of starch, glycogen and cellulose. Chemical nature of prokaryotic and eukaryotic cell wall.  

Unit - II  

Unit - III  
Amino acids: basic structure & properties (physical and chemical); function, essential and standard amino acids. Proteins: Classification based on shape, solubility and composition. The peptide bond, amino acid sequence and primary structure; backbone folding and secondary structure; tertiary structure of collagen and the forces of stabilization.  

Unit - IV  

Unit - V  
Vitamins: Classification – water soluble (B complex, ascorbic acid) and fat soluble (A, D, E, K). Structure, function and properties of vitamins – states of deficiency and excess.  

Text Book(s):  

Reference  
Objective:
1. To understand the importance of the Medicinal plant wealth in India and the role of Medicinal plants in human health care.
2. To know the role of advance technologies in the conservation and production of Medicinal plants and unraveling of the phytochemistry of the active principles of the medicinal plants which will provide the basis for drug designing

Unit - I
General Introduction: Definition, source of herbal raw materials, identification, authentication, standardization of medicinal plants as per WHO guidelines & different herbal pharmacopoeias. Collection and processing of herbal drugs. Seasonal & geographical variations; natural & artificial drying methods. Packaging & labeling of herbal drugs prior to extraction.

Unit - II
Standardizations: Determination of physical and chemical constants such as extractive values, moisture content, volatile oil content, ash values, bitterness value and foreign matters applicable to the various herbal drugs.

Unit - III
Nutraceuticals, Pesticides from natural origin, Natural Allergens and other toxic plants. Herbal Formulations: Principle, methods, single herb formulation, poly-herbal formulation & their merits and demerits. Standardization of various herbal formulations.

Unit - IV
Plant Tissue Culture Techniques & its Application in Pharmacy: Introduction, techniques of initiation and maintenance of various types of cultures. Immobilized cell techniques & biotransformation studies including recent developments in production of biological active constituents in static, suspension and hairy root cultures.

Unit - V
Analysis of Bioactive Components of Natural Sources: Phyto-chemical standardization of raw herbal extracts and their formulation by using TLC, HPTLC, GC, HPLC, UV & IR techniques.

Text Book(s):

Reference
1. Peter B. Kaufmann et al., 1999, Natural Products from Plants, C.R.C. Press.
SKILL BASED ELECTIVES

BOTANY
11UBO540601 Mushroom Culture
11UBO640602 Herbal Technology

BUSINESS ADMINISTRATION
11UBU540601 Personality Development
11UBU640602 Managerial Skills

CHEMISTRY
11UCH540601 Food and Nutrition
11UCH640602 Everyday Chemistry

COMMERCE
11UCO540601A Accounting for Executives
11UCO540601B Soft Skills for Managers
11UCO640602A Total Quality Management
11UCO640602B Fundamentals of Accounting Packages

COMMERCE (CA)
11UCC540601 Soft Skills
11UCC640602 Basics of Accounting

COMPUTER APPLICATIONS (Dept of IT)
11UBC540601A Fundamentals of IT
11UBC540601B Internet Concepts
11UBC640602A Visual Programming
11UBC640602B Flash

COMPUTER SCIENCE
11UCS540601A Office Automation
11UCS540601B Internet Concepts
11UCS640602A Fundamentals of Computer Networks
11UCS640602B E-Commerce

ECONOMICS
11UEC540601 Security Analysis
11UEC640602 Economics of Insurance

ELECTRONICS
11UEL540601 DVD Troubleshooting and Assembling
11UEL640602 PC Assembling

ENGLISH LITERATURE
11UEN540601 Business English Writing
11UEN640602 Media Skills

HISTORY
11UHS540601 Indian History for Competitive Exams
11UHS640602 Tourism and Travel Management

MATHEMATICS
11UMA540601 Mathematics for Competitive Exams
11UMA640602 MATLAB

PHYSICS
11UPH540601 Cell Phone Servicing
11UPH640602A Electrical Wiring
11UPH640602B Videography

STATISTICS
11UST540601 Data Analysis for Competitive Exams
11UST640602 Statistics for Management

TAMIL
11UTA540601 Tamil Literature
11UTA640602 Tamil Literature